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ABSTRACT

This series of 24 papers on the structure, growth and finance of higher education is divided into 6 parts. The first presents an overview of basic issues involved in the economics of higher education and identifies factors which must be considered in formulating policy. Part 2 considers the 2 most basic criteria for a higher education system--efficiency and equity--in terms of their conflicting natures and the compromises necessary between them. Part 3 discusses costs and outputs. Parts 4 and 5 consider, respectively, the outlook for American higher education in the next decade in terms of enrollment, expenditures, staff and degrees granted, and the economic outlook for private institutions. The first section of Part 6 outlines prospects for nonfederal financing -- state and local government aid -- and endowment contributions. The second section discusses the role of federal aid, not merely in supplementing other sources of finance but also in helping direct higher education toward goals set by the American public. (JS)

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THE ECONOMICS AND FINANCING OF HIGHER EDUCATION IN THE UNITED STATES

A COMPENDIUM OF PAPERS

SUBMITTED TO THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

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LETTERS OF TRANSMITTAL

OCTOBER 7, 1969.

To the Members of the Joint Economic Committee:

Transmitted herewith for the use of the Joint Economic Committee and other Members of Congress is a study of the structure, growth, and finance of higher education entitled "The Economics and Financing of Higher Education in the United States."

The views expressed in this document do not necessarily represent the views of members of the committee or the committee staff, but are examinations by experts of issues and alternatives intended to provide a focus for hearings and debate.

WRIGHT PATMAN,
Chairman, Joint Economic Committee.

OCTOBER 6, 1969.

Hon. WRIGHT PATMAN,
Chairman, Joint Economic Committee, Congress of the United States, Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is a compendium of study papers entitled "The Economics and Financing of Higher Education in the United States." The compendium is intended to serve as a means of focusing attention on the serious economic issues confronting our higher education system and to provide a context within which the essential debate on the future of higher education might take place both within and outside the Government.

The study is divided into six parts. The first presents an overview of the basic issues involved in the economics and financing of higher education and sets out some of the factors which must be considered in making decisions on higher education policy. Part II enlarges on the two most basic criteria for a system of higher education—efficiency and equity—and considers their conflicting natures and the compromises which must be made between them. Two of the factors essential to the efficiency criterion—costs and outputs—are discussed in Part III.

Parts IV and V consider, respectively, the outlook for U.S. higher education in the next decade in terms of such major variables as enrollment, expenditures, staff, and degrees granted, and the economic outlook for our private colleges and universities. Part ~~IV~~ contains two sections. The first outlines the prospects for non-Federal financing of higher education: State and local government aid and endowment contributions. The second discusses the important role of Federal aid not merely in supplementing the other sources of finance, but also in helping to direct our system of higher education toward the goals the public chooses to set for it.

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We are indebted to the authors for their outstanding work. It is hoped that the collected views of these experts will make a substantial contribution to a resolution of the major difficulties confronting our higher education system today.

The major work in planning, compiling, and editing this compendium was undertaken by Dr. Robert Haveman, who is on leave from Grinnell College. He was aided in editing, compiling, and research work by Gail Feldman and Ruth Leibert, and in administrative and secretarial work by Anne McAfee. The papers in this study represent only the views of their authors, and do not purport to reflect the opinion of committee members or staff.

John R. Stark,
Executive Director, Joint Economic Committee.

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THE ECONOMICS AND FINANCING OF HIGHER EDUCATION IN THE UNITED STATES

A compendium of papers submitted to the Joint Economic Committee, Congress of the United States, October 1969

INTRODUCTION

Institutions of higher education play a vital role in the United States economy. As firms in an industry, these institutions absorb inputs and produce an output, both of which are of value to the society. The inputs used by institutions of higher education consist not only of the services of their capital facilities and the time and energy of the most highly educated of the Nation's citizens, but also of the time and productive capacity of the students who are in attendance. The outputs of these institutions consist of a more highly educated and productive citizenry, the results of research and the discovery of new knowledge, and, indirectly, a more rapid rate of economic growth. A strong system of higher education is essential in furthering individual aspirations, in developing a progressive economy, and in insuring a humane and sensitive society.

In spite of the rapid growth in general affluence and in the enrollments experienced by colleges and universities, there are many qualified college-age citizens who are not being accommodated. Moreover, nearly all observers of our system of higher education judge that the quality of education could be improved substantially throughout the full higher education spectrum. Indeed, the recent unrest on college and university campuses argues that the relevance of the education, and the individual concern for the student, must be increased if institutions of higher learning are to retain the commitment of their students. Because of the rapidly expanding demands which will be made upon the higher education system in the coming decade, there is widespread doubt among educators and others as to whether the system will be able to meet the implicit financial requirements unless new sources of funding are forthcoming.

Recognizing the economic implications of the contributions by higher education to American society, and of the significant financial problems currently facing the Nation's colleges and universities, the Joint Economic Committee has invited a number of scholars and educators to contribute papers on the economics and financing of higher education. Because of the widespread belief that the Federal Government should assist in meeting the urgent needs of higher education, a number of these papers also deal with strategies for Federal financing. In almost all instances, the papers contained in this compendium pertain to the society's allocation of resources to higher education and the distribution of the benefits and costs of higher education among the people. The following are some of the basic questions of efficiency, equity, and financing of higher education which are addressed in this study:

- Would individual citizens, unaided by government subsidies, purchase a socially optimum level of education through private transactions in the marketplace?
- What factors in the economics of higher education combine to create a need for government participation?
- Does the present structure of higher education lead to a more, or a less, equitable distribution of society's income?
- What people in American society should be the primary beneficiaries of the public's higher education expenditures: the able and best prepared, or those less prepared from disadvantaged socio-economic backgrounds?
- Should higher education be viewed primarily as a vehicle for reducing the inequities built into our society or should the allocation of national resources to higher educaton be determined primarily by the economic returns which those resources generate?
- What factors determine the level of educational quality offered by particular institutions?
- What variables influence the costs of educating college and university students both in the short and long run, and as institutions vary in size?
- What are the implications of current student demands and unrest for the structure and organization of American institutions of higher education?
- What is the outlook for enrollment, staff, and expenditures during the next decade in higher education?
- What is the substance and seriousness of the "financial crisis in higher education" about which so much is heard?
- If additional sources of finance are necessary in the coming decade, what are the potentials of cost reduction and endowment financing in meeting this need?
- Would public subsides provided primarily by State and local governments be sufficient to insure that the optimum proportion of the Nation's resources get allocated to higher education?
- If the Federal Government assumes increased responsibility for financing higher education, what instruments and means does it have available for providing assistance and how do these instruments relate to the accomplishment of social objectives?
- How much of the financial burden of higher education today is borne by the student and how much by the public, and how much should be borne by each of these groups?

Most would agree that the American higher education system should be efficient, equitable, diverse, and of high quality. However, in the actual structuring of the higher education system, these goals often conflict. For example, the quest for equity may mean that the poorer students and those least well prepared must be given high priority in college and university attendance. While such a decision would insure progress toward the goal of social justice, it would, in all likelihood, be bought at some sacrifice in educational quality, the growth of the economy, and efficiency in higher education. Sensitive public policy must seek to provide a higher education system which incorporates the optimum compromise between these diverse and sometimes conflicting goals. It is hoped that the discussions in this collection will provide helpful background and perspective to public officials and higher education planners who must make the decisions which will determine the structure of higher education and its financing for many years to come.

Part I of this compendium presents an overview of the economics and financing of higher education. It first sketches a statistical outline of the higher education system and details past trends in expenditures, enrollment, and institutional sizes. It then examines the economic aspects of investment in higher education. Finally, it demonstrates that the spillover benefits and costs of higher education must be added to the private benefits and costs in determining the optimum level of resources to be allocated higher education. It is argued that reliance on the free market to provide higher education is not likely to result in the optimum provision of higher education services.

This overview paper also demonstrates the influence of higher education on the distribution of society's income. Conversely, it shows that the income distribution is an important determinant of which students ultimately have the benefit of higher education. On the basis of statistical evidence, it is argued that high cost, rather than the distribution of ability, is the main constraint inhibiting lower-income individuals from continuing their education after high school. On the grounds of an efficient allocation of resources as well as the promotion of equity and equality of opportunity, it is argued that the public sector must play a major role in support of higher education. Having reached this conclusion, the overview paper discusses several questions which arise in determining the optimum level and form of public aid to higher education. The size of the external benefits to society of a highly educated population, the relative advantages and disadvantages of providing support directly to institutions as opposed to students, the relative sizes of State versus Federal support, and the substitutability among different forms of public aid to higher education are all discussed in this survey.

The papers in Part II examine two of the most basic issues in forming economic policy toward higher education. These are the economic efficiency of expenditures on higher education and the distributional or equity impact of the cost and benefits of higher education. As noted earlier, the two goals of efficiency and equity are not likely to be consistent with each other. An educational system which produces the highest net economic returns and the most rapid economic growth may not be one which promotes an equitable society. Similarly, a system that promotes a more equal distribution of income and opportunity may not yield the highest rate of economic return on higher education investment. Largely because of the conflicting nature of these goals, effective planning of higher education must be particularly cognizant of these considerations.

To attain efficiency in higher education requires a comparison of the benefits produced and the costs entailed by higher education decisions. From society's point of view, it is the difference between these two values which must be maximized if resources are to be efficiently allocated. For this reason, discussions of economic efficiency in higher education require a concern with both volume and quality of output (and its measurement) and the costs of higher education institutions. The papers in Part III focus on these economic efficiency considerations. The first paper examines the factors that determine the quality of education offered by colleges and universities. The second two papers discuss the several factors which influence short-run and long-run variations in costs in institutions of higher learning. They discuss the role of enrollment growth, class size, the centralization of university functions, and the year-round use of university facilities in influencing the costs of higher education.

In Part IV, a rather long-run perspective is adopted in appraising the future structure of higher education. The social and political forces which would influence the structure of American colleges and universities are assessed in the context of current unrest on campuses and in universities. In a more quantitative vein, a series of projections into the latter part of the 1970's are presented for the pertinent higher education variables of enrollment, staff, expenditures, and degrees granted. Because of the significant portion of total higher education costs which are accounted for by academic salaries, one of the papers in this section focuses on the academic labor market. The authors project the supply of faculty forthcoming from the graduate schools and analyze the relationship of the military draft to this supply. All of the papers in this part provide basic data and information for long-range institutional planning in higher education.

The papers in Part V focus on the implications of increasing demands, higher costs, and pressures for change on private institutions of higher education. The first paper in this section examines the trends in higher education expenditures and income over the past decade for a sample of private universities. In an appraisal of the factors which are likely to influence these trends in the future, the author concludes that private universities will be faced with a substantial deficit unless new sources of income are discovered. He notes that the ultimate result of this shortfall in financial support may entail either a reduction in the quality of education offered by private universities, or the failure of enrollments to increase in line with expectations. The second paper provides estimates of future expenditures by a group of thirty private colleges based on past trends in the costs and expenditures of these institutions. In addition, this paper comments on the financial impact of the common understatement by institutions of projected future needs and their tendency to ignore significant new developments and structural changes which are expected in higher education during the next decade.

The final section of this study, Part VI, deals with the financing of higher education in the decade of the 1970's. In the first section, the prospects for financing higher education from sources other than the Federal Government are evaluated. The author of the first paper presents an overview of the potential sources of higher education finance and concludes that even if significant aid is received from Federal, State, and local governments, as well as from private sources, substantial reliance will have to be placed on higher tuitions if the quality of higher education is to be maintained. He also discusses the various means of reducing the short-fall in finances by the elimination of numerous inefficiencies in college and university operations. He suggests means for both increasing productivity and reducing the costs of higher education institutions. In the other papers in this section, State and local government and endowment support are evaluated as instruments for maintaining financial support of higher education.

Section B of Part VI is premised on the widely accepted proposition that even if the financial productivity of all of the instruments discussed in Section A were increased—if costs were reduced, if endowments were managed so as to increase their contribution to current operations, and if optimistic expectations concerning aid from foundations and State and local governments were realized—a serious gap would remain between the expenditures necessary to maintain higher education quality and the revenues available to support those expenditures. In the recent past, Federal Government agencies, officials of higher education institutions, and private commissions concentrating on the economic problems of higher education have argued that Federal Government assistance will be necessary to fill this gap. In Section B, the major issues and various questions which arise in connection with Federal aid to higher education are discussed. As the first paper in this section observes, the debate over Federal aid to higher education is important less because it is likely to involve a substantial expenditure of funds than because decisions on the form of Federal aid will strongly influence the very structure of the Nation's higher education system, as well as the characteristics of those who will benefit from it and pay for it. As with discussions concerning the allocation of national resources to higher education, the debate on Federal assistance must also deal with questions of efficiency and equity.

In the first two papers of Section B, the basic decisions which must be made in determining the optimum form of Federal aid are surveyed and some recommendations are offered. The second paper presents a substantial analysis of the benefits and costs of a number of forms of student aid, including work study programs and grants and loans to students. In the third paper, a summary of the major findings of the Carnegie Commission on Higher Education, including a discussion of their recommendations is presented. The remaining papers in this section discuss other strategies for Federal aid. These include outright grants to students, student loans, institutional aid, a national bank for long-term contingency repayment of student loans, and the use of income tax credits as means of providing Federal assistance to higher education.

Throughout this study, one particular theme recurs: in seeking an optimum allocation of resources to higher education, decisionmakers must focus on the two primary criteria of efficiency and equity. Comprehensive national planning for higher education requires that the value forgone by using resources for higher education rather than for some other purpose must be compared with benefits in the form of higher incomes, economic growth, and an educated citizenry which higher education investment produces. Similarly, planners of higher education must continually appraise the success of the system in achieving the equity goals which society values most.

In assessing the efficiency and equity goals, an important problem is in determining both the returns from investment in higher education and the distribution of these returns among the people. The difficulty in assessing these returns inheres in the fact that many of the benefits as well as the costs of higher education do not accrue directly to the individual who is being educated. Indirectly, the student's family, as well as the entire society, benefits when a student obtains a higher education.

It must also be noted that the total benefits of a college or university education to the individual himself are not measured simply by the additional income earned by an individual because he is so educated. There are numerous indirect, indeed nonpecuniary, benefits to the college graduate.

Similarly, the cost of a student's education consists not merely of the payments he must make for his schooling and other expenses, but also the indirect cost of the income which the student would have earned had he not been attending school. In addition, it must be remembered that the cost to the society of educating a student exceeds by a wide margin the portion of that cost which is paid for by the student. Indeed, as many of the papers in the study point out, the major burden of higher education costs is shared by the taxpayers, private individuals through contributions, foundations, and by the less-than-market salaries paid to many of the faculty resources employed by higher education institutions.

In addition to the unique nature of the benefits and costs of higher education, there are a number of additional characteristics present in the market for higher education which are discussed in the papers in this study. Many of these characteristics, like the existence of external or economic growth benefits, justify public action in the production and distribution of higher education services. Among these market conditions are imperfect capital markets due to the peculiar risk structure of student loans, monopoly elements in the supply of higher education, insufficient information on the parts of students, their families, and the lending institutions concerning the returns to educational investment, and the resource distortions created by public subsidy to the producer rather than the purchaser of higher education services.

This study is intended to satisfy several objectives. First, there is a need to determine more clearly the dimensions of the economic crisis presently confronting our higher education system. Education authorities both in and outside of Government agree that the current and expected demands for higher education have serious financial implications for colleges and universities. The recent student unrest both reflects and tends to obscure the basic economic problems of our institutions of higher learning. Many of the student demands pertain to structural deficiencies of our universities, the correction of which will require substantial financial commitments on the part of the institutions. Yet, the manner in which these complaints are often voiced has tended to hinder rational consideration of these issues. It is hoped that this study will provide an objective context in which to review the state of higher education in our country today and its ability to meet the demands put upon it.

Related to this is the necessity for higher education planners to make informed judgments on the future demands which will be placed on higher education institutions and the alternative methods of satisfying them. The papers in this collection contain the views of eminent scholars and experts on the prospects for structural and economic change in our colleges and universities in the next decade. They present the data necessary to analyze the consequences of these changes and to appraise the merits of the alternative policies for growth and development.

As mentioned above, Federal aid to higher education will be a subject of major debate over the next several years as educators and government policymakers attempt to discern and implement the appropriate role of the Federal Government in relation to higher education. A further objective of this compendium, therefore, is to provide an economic background for this debate. Since the resources available to the Federal Government are limited, it is essential that decisions on Federal expenditures for higher education consider economic principles and criteria. If public policy toward higher education is to be efficient, it must be subject to the same criterion that is appropriate for other public investments; do the benefits derived sufficiently outweigh the costs to justify diverting resources from some other use to higher education? While judgments made on grounds of economic efficiency must be tempered by considerations of distributional equity, rational decisionmaking requires that the economic evaluations be made.

The final objective of this compendium is to awaken and further develop the interest of economists and other social scientists in what Kenneth Boulding has called the "grants economy." The attention of most academic economists has, in the past been monopolized by the private sector and its profit-maximizing entrepreneurs. This attention has been disproportionate in view of the size and rate of growth of the public and nonprofit sectors of the economy. Meaningful and rational decisionmaking within the grants economy awaits a comprehensive exploration by economists of these nonprofit sectors.

PART I

AN INTRODUCTION TO THE STRUCTURE AND ECONOMICS OF HIGHER EDUCATION

The Economics and Public Financing of Higher Education: an Overview

Roger E. Bolton *

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*The author is Associate Professor of Economics, Williams College.

PREFACE

This paper is intended to be a fairly comprehensive study of the economic facts and issues relevant to the debate on the appropriate ways for governments to subsidize and ease the private loan financing of higher education.

I have usually tried, no doubt without complete success, to submerge my own opinions in a reasonably balanced survey. It is best, however, if I do give some indication of them here at the start in this more personal preface. While I see many advantages in higher education being able to rely on a variety of sources for support, I feel that the present level of public aid to it would be better spent if it were concentrated more directly on students, and on lower income students. Aid to higher education should be one part—only one part—of a broader strategy to improve the distribution of income in American society. Hopefully, any new large programs by any level of government would concentrate their funds in this way. But even a reallocation of present levels of expenditure from institutions to low income students would be an improvement, for it would very probably *increase* the amount of higher education and its social benefits. Some of the present public aid helps make high quality education very inexpensive for many families who are quite able to pay more of the costs than they do, and who would willingly pay them if they had to.

Although the study covers many areas and is quite detailed in its analysis of some problems, it is not a "review of the literature." I have drawn on published sources where I felt they usefully supplemented the basic core of the analysis, which relies on conventional economic theory and on empirical observation. But I have been very selective in drawing on those sources, and I have not attempted to summarize very many of the expressions of opinion, or the proposals for new programs, or the statistical analyses of the impact of particular programs, which many individuals and groups of educators have produced. I must make this disclaimer early, because some omissions of that sort will be conspicuous to readers thoroughly familiar with the subject. But the other papers in this compendium will remedy the omissions.

I am very much indebted to many persons for their assistance. To name only some, Robert Haveman, Rashi Fein, Joseph Pechman, Joseph Kershaw, Stephen Lewis, Jr., Robert Hartman, Henry Aaron, Christopher Clague, Robert Kreidler, Thomas Ford, John Talmadge, Warrick Elrod, Jr., and many students and faculty members at Williams College. For patience and understanding, I owe a debt, usual in nature but larger than usual in measure, to my wife, Judy. None of these people is responsible for any of the positions I have taken or errors I have made.

I. HIGHER EDUCATION IN THE UNITED STATES

A brief statistical account of the "higher education industry" in the United States will help establish its enormous size and diversity, both of which are important aspects of it as far as public policy is concerned. The following material is almost wholly based on the U.S. Office of Education's thorough compendium,. *Digest of Educational Statistics*, 1968 edition.[1]

GENERAL OVERVIEW

There were about 2,400 institutions of higher education in the United States, enrolling nearly 7½ million students and employing about one-half million faculty members in the fall of 1968. The Office of Education estimates their total expenditures for education, research, and student care in the 1968–69 academic year will be $20.4 billion, of which $12.2 billion will be by public institutions and $8.2 billion by private ones. Of this total, current expenditures and interest are estimated at $17.0 billion and capital outlays at $3.4 billion. The more rapid expansion of public institutions is suggested by the fact that their relative lead in capital outlays, $2.4 billion versus the $1.0 billion for private institutions, is considerably greater than the margin in current expenditures, $9.8 billion to $7.2 billion.

The $20.4 billion is not the best indicator of the total share of the higher education sector in the economy. It includes some institutional expenses for auxiliary enterprises, such as dormitories, dining halls, and bookstores, and much of this is not really a cost of education, since it represents ordinary living costs which would have to be paid by or for students whether or not they went to college. Large expenditures for organized research are also included, and it is an open question how much of those expenditures should be credited to the *education* of students, as opposed to research itself.

The capital costs are not accurately stated either. The $3.4 billion includes the entire value of new facilities constructed during the year. The better measure is depreciation during the year on all facilities being used, no matter when they were constructed, plus some imputed interest return on all the net capital employed, no matter whether interest was paid or not. These figures are not available.

But the most important reason why the $20.4 billion is limited in importance is that it understates total costs by covering only the costs of institutional operation. Another very large item is the opportunity cost of students' own time. A value for this depends on what average earnings are foregone by over 7 million young men and women spending a very large part of their time in school instead of available full time for the labor force. This is not known either, but even if one uses an average figure as low as $2,000 per year per student, an additional amount of more than $14 billion would have to be added.

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[1] U.S. Government Printing Office, Washington, D.C., 1968. All of the statistics in this section are from the 1968 *Digest* unless otherwise noted.

Nevertheless, the figure given tells something of the importance of higher education in the economy. Another dimension is the number of people involved. The Office of Education estimates the fall 1968 enrollment at 6,758,000 *degree-credit* students in the United States, 1,496,000 of them enrolling for the first time that fall. Of them, 4,019,000 were men and 2,739,000 women. Sixty-eight percent were in public colleges and universities, and thirty-two percent in private ones. There are also many students—564,000 in the fall of 1967, the latest year available—enrolled in undergraduate programs not chiefly creditable toward a bachelor's degree. A much larger proportion of these students are in two-year colleges than the proportion of degree-credit students, and a much larger proportion of them are in public institutions than of degree-credit students.

The figures for the previous year, 1967, have been analyzed in more detail. The *total* enrollment, degree-credit and other, in the fall of 1967 was 6,912,000. One breakdown of this total is the following (figures in parentheses are the numbers of institutions of the type listed):

Public institutions (934):	
State and Federal controlled (490)	3,350,000
Local controlled (444)	1,467,000
Total	4,816,000
Private institutions (1,440):	
Independent of churches (540)	1,120,000
Church related (900)	976,000
Total	2,096,000
Grand total	6,912,000

Note.—Here and elsewhere in this section, detail may not add to total due to rounding.

Another classification of the 1967 enrollment is shown in Table 1-1, which shows the relative importance of two-year institutions, universities, and all other four-year institutions. The last category is not further subdivided, but other data for a recent year, 1965, showed that about 27 percent of the students in them were in public liberal arts colleges, 38 percent in private liberal arts colleges, 23 percent in public teachers colleges, and the rest in a variety of other kinds of colleges and professional schools.

The total enrollment has mushroomed since World War II. Between 1947 and 1968 degree-credit enrollment grew from 2,338,000 to 6,758,000, or 189 percent, or about 5.2 percent per year. This rise is not explained only by the increase in population. The number of students as a percentage of the population aged 18–21 has risen steadily all through the period except in 1950 and 1951, although the 1949 level was not regained until 1954. In 1947 there were 25.2 students per 100 population aged 18–21; in 1967 there were 46.6.

The enrollment of women has grown much faster than that of men, and the public institutions have easily outpaced the private ones.

Although public enrollment was actually less than private as late as 1951, it reached double the private enrollment in 1967, even counting only degree-credit students. Between 1947 and 1968 students in public institutions increased from 1,152,000 to 4,629,000, a rise of 302 percent (6.8 percent per year), compared to from 1,186,000 to 2,129,000 in privates ones, a rise of only 80 percent (2.8 percent per year). The public institutions share of degree-credit enrollment thus rose from 49 percent to 68 percent.

TABLE 1–1.—*Distribution of fall 1967 enrollment by type of institution*

[Thousands of students]

Type[1]	Public	Private	Total
2-year institutions (520; 266)	1, 372	141	1, 513
Universities (92; 64)	1, 873	716	2, 589
All other 4-year institutions (322; 1,110)	1, 571	1, 239	2, 810
All institutions (934; 1,440)	4, 816	2, 096	6, 912

[1] Figures in parentheses are, 1st, the number of public institutions of the type listed, 2d, the number of private institutions.

TABLE 1–2.—*Distribution of fall 1967 enrollment by size of institution*

Number of students	Percent of all institutions (base=2,374)	Percent of all enrollment (base=6,912,000)
Under 200	12. 3	0. 5
200 to 499	14. 5	1. 7
500 to 999	22. 4	5. 6
1,000 to 2,499	24. 9	13. 0
2,500 to 4,999	11. 3	13. 8
5,000 to 9,999	8. 1	20. 1
10,000 to 19,999	4. 2	20. 1
20,000 or more	2. 3	25. 2
Total	100. 0	100. 0

There is great diversity in the kinds of institutions which flourish. One example is the diversity in size, as shown in the size distribution in Table 1–2. This tabulation shows that the size distribution is greatly skewed: there are relatively many small institutions and relatively few very large ones, which however enroll a very large share of the students. Table 1–3 shows the same thing in a different way by comparing the median size and the mean size of different kinds of institutions. The fact that the mean is invariably higher than the median shows the skewness. This table also shows that universities are generally much larger than other institutions and that public institutions are on average much larger than private ones. I expect that many persons familiar with only one kind of institution will find many of the median figures startling.

One final figure on the number of individual students involved. In academic year 1966–67, it is estimated the following numbers of earned degrees were awarded to graduates: bachelor's or first-professional degrees requiring four or five years, 550,000; first-professional degrees requiring six or more years (almost all in law, medicine, dentistry, and religion), 33,100; master's degrees other than first-professional, 147,300; doctor's degrees (Ph. D., Ed. D., etc.), 19,800.

TABLE 1–3.—*Mean sizes and median sizes of different kinds of institutions*

Type	Mean number of students	Median number of students
All institutions	2,910	1,050
Public	5,160	2,430
Private	1,460	740
Universities	16,600	13,210
Public	20,360	16,670
Private	11,180	8,790
Other 4-year institutions	1,960	980
Public	4,880	3,650
Private	1,120	800
2-year institutions	1,930	870
Public	2,640	1,540
Private	530	360

Note: Computed by usual interpolation method from size distributions like the one in table 1–2.

HOW COLLEGES AND UNIVERSITIES FINANCE THEMSELVES

How institutions finance themselves is one major aspect of the financing of higher education; how students finance the payments they make to institutions is the other major aspect. On the former, fairly detailed statistics are available for the sources of current funds in the 1965–66 year and for the sources of capital funds in the 1963–64 year. The statistics are based on Office of Education surveys which cover the great bulk of institutions.

SOURCES FOR CURRENT EXPENDITURES

The sources of current fund income for 1965–66 are shown in Tables 1–4 through 1–6. In the first table, we see the picture for all institutions combined and for public and private institutions separately. There is a percentage breakdown of total current fund income, including the income of auxiliary enterprises (dormitories, dining halls, stores, etc.), and it shows the usual, well-known but dramatic differences between public and private schools in their relative reliance on tuition, endowment earnings, private gifts, and state and local governments. The table also shows that the difference in reliance on Federal government support is not all that great.

Table 1-4.—*Sources of current fund income for institutions of higher education, 1965–66*

[Dollar amounts in millions]

Source	All institutions		Public		Private	
	Amount	Percent	Amount	Percent	Amount	Percent
Educational and general:						
Tuition and other charges	$2,950	23.1	$1,010	13.7	$1,939	35.9
Endowment earnings	354	2.8	37	.5	317	5.9
Private gifts	729	5.7	187	2.5	542	10.0
Governments	6,114	47.8	4,686	63.3	1,428	26.5
Federal, organized research	(2,038)	(15.9)	(895)	(12.1)	(1,143)	(21.2)
Federal, other	(715)	(5.6)	(527)	(7.1)	(189)	(3.5)
State	(3,043)	(23.8)	(2,954)	(39.9)	(89)	(1.7)
Local	(318)	(2.5)	(311)	(4.2)	(8)	(.1)
Other	506	4.0	267	3.6	240	4.4
Subtotal	10,654	83.3	6,187	83.6	4,466	82.7
Auxiliary enterprise [1] income	2,143	16.7	1,210	16.4	932	17.3
Total current fund income	12,796	100.0	7,398	100.0	5,399	100.0

[1] Derived from same sources as educational and general, but complete breakdown not given. However, over 85 percent comes from charges paid by users.

Source: U.S. Office of Education *Financial Statistics of Instutions of Higher Ecucation: Current Funds, Revenues and Expenditures*, 1965-66, USGPO, 1969.

Table 1-5.—*Percentage breakdown of current fund income, excluding auxiliary enterprise income and all organized research, 1965–66*

	All institutions	Public	Private
Tuition and other charges	35.9	20.2	60.4
Endowment earnings	4.2	.6	9.6
Private gifts	7.0	2.1	14.7
Governments	47.1	72.3	8.2
Federal	(8.7)	(10.6)	(5.9)
State	(34.6)	(55.5)	(2.2)
Local	(3.8)	(6.2)	(.1)
Other	5.7	4.8	7.2
Total	100.0	100.0	100.0

Source: Same as for table 1-4.

The figures in table 1-4 are perhaps a bit misleading because they include so much income which is not destined to be used for education more narrowly defined. The total current fund income includes amounts for auxiliary enterprises and for organized research projects. Without passing judgment on the difficult question of the value organized research has for "education," I have calculated the percentage breakdown by source of all funds *other* than amounts earned in auxiliary enterprises and received for the support of organized research projects. Most of the income excluded because it was for research came from the Federal government source, of course, but not all; some private gifts, endowment earnings, and state and local government payments were also excluded on this ground. The resulting breakdown is shown in Table 1–5, which presents few surprises: the sharp distinctions between public and private show up in the breakdowns of the narrower total too. What does happen is that a greater reliance on the Federal government by public institutions becomes evident, whereas in the previous table the Federal funds for research at private institutions reversed the picture.

In Table 1–6 there are many more details. The same sources shown in Tables 1–4 and 1–5 are shown for a greater variety of colleges and universities; separate information is given for universities, other four-year colleges, and two-year colleges, and for public and private types separately within each of those three categories.

SOURCES FOR CAPITAL EXPENDITURES

Table 1–7 shows the sources of money destined for capital expenditures. The items of greatest interest are the extent of state government financing for public institutions, the reliance by private institutions on gifts and grants to an even greater extent for capital expenditures than for current income, and the fairly common use of borrowing from outside creditors, even additional to the large amounts borrowed from the Federal Government on very favorable terms.

TABLE 1–6.—*Percentage breakdown of current fund income, 1965–66*

Source	Universities		Other 4-year		2-year	
	Public	Private	Public	Private	Public	Private
Pt. A: Breakdown of all current fund income:						
Tuition and other charges	13.0	30.4	15.6	40.0	13.5	52.2
Endowment earnings	.7	7.0	.1	5.0	.2	2.1
Private gift	3.4	9.3	1.0	10.7	.4	11.3
Governments	62.7	35.7	61.3	19.4	73.0	2.5
Federal, organized research	(17.4)	(27.0)	(2.1)	(17.1)	([1])	(.7)
Federal, other	(7.0)	(5.7)	(8.5)	(1.6)	(4.3)	(1.4)
State	(37.7)	(2.9)	(48.2)	(.6)	(34.6)	(.3)
Local	(.6)	(.2)	(2.5)	(.1)	(34.1)	(0)
Auxiliary enterprise	16.0	12.1	20.5	21.3	8.1	29.5
Other	4.2	5.5	1.6	3.6	5.0	2.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
(Base, in millions of dollars)	(4,929)	(2,511)	(1,772)	(2,708)	(697)	(179)
Pt. B: Breakdown of total excluding auxiliary enterprise and all organized research:						
Tuition and other charges	21.3	53.0	20.3	65.7	14.6	74.8
Endowment earnings	.9	11.8	.2	8.3	.2	3.0
Private gifts	3.0	12.3	.9	16.7	.5	15.8
Governments	68.7	13.8	76.8	3.8	79.3	2.5
Federal	(11.7)	(9.9)	(11.1)	(2.7)	(4.6)	(2.1)
State	(56.1)	(3.9)	(62.5)	(.9)	(37.6)	(.4)
Local	(.9)	([1])	(3.2)	(.1)	(37.1)	....
Other	6.1	9.1	1.8	5.7	5.4	3.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
(Base, in millions of dollars)	(2,975)	(1,439)	(1,353)	(1,648)	(640)	(125)

[1] Less than 0.05 percent.

Source: Same as for table 1–4.

TABLE 1-7.—*Sources of plant-fund receipts for institutions of higher education, 1963-64*

[Dollar amounts in millions]

Source	All institutions		Public		Private	
	Amount	Percent	Amount	Percent	Amount	Percent
Income from:						
Governments	$829	32.7	$785	48.9	$43	4.6
Federal	(134)	(5.3)	(93)	(5.8)	(41)	(4.4)
State	(632)	(24.9)	(630)	(39.2)	(2)	(.2)
Local	(63)	(2.5)	(62)	(3.9)	([1])	([1])
Student fees	71	2.8	61	3.8	10	1.1
Private gifts and grants	315	12.4	31	1.9	284	30.6
Other	88	3.5	61	3.8	27	2.9
Transfers from:						
Current funds	292	11.5	144	9.0	148	15.9
Other institutional funds	131	5.2	61	3.8	69	7.4
Loans from:						
Federal Government	225	8.9	106	6.6	118	12.7
Other noninstitutional sources	520	20.5	351	21.9	169	18.2
Institutional sources [2]	64	2.5	5	.3	59	6.4
Total	2,534	100.0	1,606	100.0	928	100.0

[1] Less than $500,000.

[2] Endowment funds, current funds, etc.

Note: Amounts will not add to totals because of rounding.

Source: U.S. Office of Education, *Higher Education Finances, Selected Trends and Summary Data*, USGPO, 1968, pp. 16-18.

EXPENDITURES

While considerable information is also available on how colleges and universities *spend* their money, only a few details of the statistics are relevant to this study. One is that the current fund expenditures (excluding expenditures for organized research, for auxiliary enterprise operation, student aid, and current funds used to add to physical plant) *per student* are considerably larger in private institutions than in public ones. In 1965-66 the expenditure per student was $1,477 in private higher education and $1,161 in public, with the average for both together being $1,265. This ranking of private over public also held true for the three kinds of schools separately: universities alone, $1,968 versus $1,714; four-year colleges, $1,262 versus $959; and two-year colleges, $860 versus $535.

Another important difference is in the amount of student aid grants given. In 1965-66, student aid grants were 9.4 per cent of current fund expenditures (again excluding the same things as in the previous paragraph, which means student aid expenditures themselves excluded) in private institutions and only 3.4 per cent in public ones.[2]

Finally, private institutions also owned a bit more physical plant (book value) per student in a recent year, 1964. They owned about $5,500 per student; public institutions owned about $4,700.[3]

RECENT TRENDS IN FINANCING

A recent Federal report contained information on the changes between the 1959-60 year and the 1965-66 year in current fund income, and how fast the different sources of it grew. Table 1–8 shows this for total current income and Table 1–9 for income per student (see Table 1–8 for citation of report).

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[2] All figures in this paragraph calculated from data in the same source as for Table 1-4, pp. 9, 12-13.

[3] U.S. Office of Education, *Digest of Educational Statistics*, 1968, p. 102.

In Table 1–8 we see that public institutions did not expand their income appreciably faster than private ones, despite the fact that their student bodies grew much more rapidly.[4] This indicates immediately that their income per student has grown much more slowly. This is verified by the figures in the upper left corner in Table 1–9. Some of this is probably due to the deliberate expansion by public institutions professing to offer only relatively low quality education, and needing lower income per student to finance it.

To return to Table 1–8, it is interesting to look both down the columns and across the rows. The state government column shows the relative emphasis on junior colleges, and the Federal non-research column shows emphasis on private institutions. Federal aid not tied to research has increased much faster than other income, especially for the private schools. And endowment earnings and private gifts and grants have lagged far behind. The data for junior colleges separately show that both public and private ones received rapid increases in Federal non-research funds. The fortunes of the four-year colleges are interesting: both private and public have increased the organized research they do for the Federal government, but it is only the private ones which have found other Federal support growing faster than total income.

TABLE 1–8.—*Average annual percentage increase in current income from selected sources, 1959–60—1965–66*

Type of institution	Total income	Tuition and fees	Organized research (Federal)	Other Federal	State government	Local government	Endowment earnings	Private gifts and grants	Auxiliary enterprises
All institutions	14.1	15.6	16.2	20.9	13.9	13.1	7.5	9.2	13.2
Public	14.5	17.9	16.2	17.5	13.9	13.3	7.4	11.0	13.8
Private	13.5	14.5	16.2	31.9	15.4	8.9	7.5	8.7	12.4
Public:									
Universities	14.1	16.8	16.1	19.4	13.0	(1)	6.7	10.5	14.4
Other 4-year	13.8	18.1	19.1	12.1	13.7	11.9	12.3	17.3	12.8
2-Year	20.7	25.6	(1)	44.2	23.9	15.8	18.4	6.2	12.2
Private:									
Universities	12.9	13.0	14.3	30.8	15.8	7.3	8.8	10.2	12.0
Other 4-Year	13.9	15.5	19.4	35.1	12.6	12.7	5.8	7.6	12.6
2-Year	14.1	16.0	(1)	40.6	(1)	(1)	7.4	8.3	12.8

[1] The change in this income source is not particularly relevant for this type of institution.

Source: U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan for Federal Financial Support for Higher Education* (mimeo), 1969, p. 46.

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[4] The reader may get more out of the tables if he remembers that in the six-year period covered, a variable very close to *doubles* if it grows at 12 per cent per year.

Table 1-9.—*Average annual percentage increase in current income per student, 1959-60 to 1965-66*

Type of institution	Total income	Tuition and fees	Organized research (Federal)	Other Federal	State government	Local government	Endowment earnings	Private gifts and grants	Auxiliary enterprises
All institutions	5.5	7.0	7.6	12.3	5.3	4.5	−1.1	0.6	4.6
Public	4.0	7.4	5.7	7.0	3.4	2.8	−3.1	0.5	3.3
Private	8.1	9.1	10.8	26.5	10.0	3.5	2.1	3.3	7.0
Public:									
Universities	4.3	7.0	6.3	9.6	3.2	(1)	−3.1	0.7	4.6
Other 4-year	3.6	7.9	8.9	1.9	3.5	1.7	2.1	7.1	2.6
2-year	7.8	12.7	(1)	31.3	11.0	2.9	5.5	−6.7	−0.7
Private:									
Universities	9.0	9.1	10.4	26.9	11.9	3.4	4.9	6.3	8.1
Other 4-year	8.1	9.7	13.6	29.3	6.8	6.9	0.0	1.8	6.8
2-year	2.5	4.4	(1)	29.0	(1)	(1)	−4.2	−3.3	1.2

[1] The change in this income source is not particularly relevant for this type of institution.

Source: Same as for table 1-8 p. 20.

Table 1-9 shows the private sector faring much better than the public in income per student. Every row of this table should be the same as the corresponding row of the previous table, minus some constant, the constant being approximately equal to the rate of growth of enrollment in the type of school shown in the row (the rate of growth of income per student is closely approximated by the rate for income minus the rate for students). Therefore, along a row, the relative ranking of the sources of income will be the same as in the previous table. But it is in the columns where the differences are found: the first column shows that private schools have increased income per student twice as fast as the public ones. Other columns show that this was true for a whole variety of individual sources as well, including tuition, organized research, other Federal aid, and even state government funds! Extremely illuminating is the Federal non-research column, which shows this aid growing much faster at private institutions. In the public sphere, it is only the two-year college which has Federal non-research funds increasing nearly as rapidly as at private institutions.

The report from which these figures are taken also notes that faculty salaries increased by about 5.5 per cent per year during the period, so that income per student would have had to increase that fast to maintain the value of faculty resources per student. This is just what was achieved. Since other prices increased less than 2 per cent per year, institutions were able to increase the value of those resources per student, and thus also the value of all resources combined (source for Tables 1-8 and 1-9, pp. 11-12). Any increase in the productivity of those resources, of course, was an added factor in increasing the quality of education.

While no details are given, the same report notes that private institutions increased the book value of their physical plant by about 50 per cent during the period, while public institutions did so by only 12 per cent (p. 13). This would indicate very slow growth in book value of plant per student in public institutions, about 1.5 per cent for the whole period.

ESTIMATED PERSONAL COSTS FOR STUDENTS

The Office of Education has estimated the following average total costs for a student's tuition, required fees, and room and board at a four-year institution in the 1968–69 school year: public institutions, $1,133; private, $2,395. Most of the difference is of course accounted for by tuition and fees, which averaged $298 in the public and $1,436 in the private sector.[5]

TOTAL PUBLIC EXPENDITURE

As further detailed in Chapter V, the Federal Government estimated its expenditures on higher education at $5.9 billion in fiscal year 1968, including research and development, and $3.7 billion excluding it (but including general support for science education). These are actually obligations, not expenditures proper. The Commerce Department reports that State and local governments spent $9.9 billion in calendar year 1968 on higher education. *Survey of Current Business*, July 1969, p. 34.

II. THE COSTS AND BENEFITS OF HIGHER EDUCATION

In this section I shall discuss some of the distinctive economic aspects of higher education. These are aspects which the economist *qua* economist focuses on in assessing whether the economic system functions properly with respect to higher education. What special steps, if any, must be taken to make sure enough higher education is produced, to make sure that it is produced in the right way, and to make sure that the distribution of its benefits among society's members is according to the society's fundamental goals?

An examination of these aspects offers insights into just how higher education is similar to the other goods and services the economic system produces, and how it is different. There are important ways in which it is different, but it must not be forgotten that it is also similar in certain ways to other goods. Higher education is an output of the economy, albeit an intangible one, and it uses up resources which might have been used to produce other things. It is theoretically possible to have too much of it. This point is not always well enough appreciated, and policies are sometimes advocated which would produce only a very small amount of additional higher education at a very great expense in resources, or at the cost of achieving other important goals, such as an equitable distribution of income.

The discussion here is not extensive, and centers only on the most important principles. Its conclusions are actually rather familiar, and my purpose is merely to introduce widely accepted notions about higher education in a way which best leads into the later chapters.

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[5] U.S. Office of Education, *Digest of Educational Statistics*, 1968, p. 95.

In this section I shall first review briefly three important aspects of the costs and benefits of higher education which raise doubts as to whether reliance on private financing is appropriate. Then I shall go into more specific details about costs and benefits in turn, which are also relevant for the details of any subsidy arrangements the public may want to make.

THREE SPECIAL ASPECTS

THE PUBLIC INTEREST

A traditional distinction in the economic literature on higher education is the distinction between private benefits and external benefits. Private benefits refer to benefits which a person investing in higher education receives himself; external benefits refer to the ones which accrue only to society in general, without directly increasing the satisfaction of the individual who possesses the education.

The benefits to the individual, which show up in his monetary income or his non-monetary advantages, are very large. This explains why individuals and families finance a great deal of investment in higher education out of their own time and funds. But it has always been assumed that some of the benefits of all levels of education accrue only to society as a whole. These benefits are external to the individual, in that they result from his own education, but cannot be turned by him into his own satisfaction directly. The education benefits his neighbors as well, and the realm of the "neighborhood" is very large indeed in the modern world, because of migration, because the economy depends heavily on the diffusion of new knowledge for growth, and because all men must work and live closely with others. Taxpayers have long accepted that such external benefits are legitimate grounds for their support of higher education. The extensive development of state and city colleges and universities demonstrates this. The reasoning behind this traditional public decision to subsidize higher education does not focus on equity; it is not that since some of the benefits accrue to society at large, society at large *ought* to pay some of the educated person's costs, as a matter of fairness. Rather, it focuses on the fear that if the public does not commit itself in advance to pay part of the costs, it will not be able to get the benefits. In short, without some sort of subsidy, it is feared, individuals will underinvest in education—too little of it will be produced, meaning that additional investment in it would have a value to society greater than the subsidy which would be necessary to make the additional investment. The subsidy, then, is an effort to induce the production of more higher education than individuals would want otherwise. For higher education (and even high school, beyond the age up to which persons are compelled to attend), the traditional subsidy is best seen as a bribe.

INVESTMENT IN HUMAN CAPITAL

A crucial feature of higher education is that it is a capital good. Creating it is investment. Education has a long life over which it provides its benefits, both the ones which the individual does enjoy and the ones which spread over all of his neighbors in society. Like other long-lived durable goods, higher education is expensive; since it is something which can pay off its cost only over a very long period, its cost looms large compared to the annual income of the average family. It is not surprising that a good which lasts so long is expensive to build. Training the mind in general habits of thought and in the knowledge of specific facts to equip it for a lifetime of work takes a lot of the student's own time and other costly resources. The costs of higher education, in the broader social sense of the resources which are absorbed, must be paid for—while the capital good is being created. Since the costs loom so large compared to annual income, financing the purchase is a major proposition for a family. The sacrifices of the young person's time and of the goods and services which must be given up to free income for the purchase of schooling are very great indeed. The largest part of the goods sacrificed by the person or his family are the ones they could have bought if his time had been spent earning a cash income instead of studying. Without subsidies, there would be enormous obstacles to the purchase of higher education by poorer families. Since the present subsidies do not restore much of the earnings lost by not working instead of studying, they still leave significant obstacles to poorer families. These obstacles are not really different from the ones which prevent poor families from buying new Cadillacs or summer homes or vacations in Europe, but the public may be less willing to let them remain as barriers to education.

DIFFICULTIES OF LOAN FINANCE

Another feature of higher education makes it hard to resort to what would seem a natural solution, financing investment by borrowing. Because education is investment in human capital, it is notably less amenable to loan finance than physical investment in buildings, machines, or inventories.[1] There is a lack of security for the lender; he cannot take out a mortgage on the educated person's ability. Then, too, so much of whether education succeeds or not depends on things other than the education, like motivation, which create risk the loan cannot be repaid. Education is a different kind of capital from machines or buildings, because it is not embodied in a concrete form, the productivity of which is largely independent of who owns it. The productivity of education depends heavily on personal characteristics of the borrower which are beyond the control of the lender and about which he may have little knowledge. If the owner of physical capital defaults on a loan he used to finance it, the lender can repossess the capital and resell it to someone else; no such option exists if the loan had financed education. By its very nature, education is an investment with some risk even to the person getting the education, merely because of the lack of knowledge of whether it can be put to good use long enough to pay off. The risk may inhibit even a rich person able to finance all costs himself. The situation is worse for a poorer person, for he will find it difficult to borrow in the normal capital market because he can offer no physical security to lenders. Thus, *either* low self-confidence *or* low income will prevent people from investing in themselves unless the public intervenes. Unfortunately, self-confidence may be lowest in the groups whose income is lowest.

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[1] This point is widely made. For succinct statements, see Milton Friedman, *Capitalism and Freedom*, University of Chicago Press, Chicago, 1962, pp. 100–4; and Gary Becker, *Human Capital*, National Bureau of Economic Research, New York, 1964, pp. 55–58.

THE COSTS OF HIGHER EDUCATION

The costs of higher education are properly measured by the value of opportunity uses elsewhere of the real resources used in the production of the education. In economics, the cost of a good is measured by the value of the other goods which must be given up in order to employ resources in the production of the good in question. For higher education, it is important to distinguish "direct" and "indirect" costs. Most direct costs are the costs of the resources, including labor, used by the educational institution for instructional purposes. If the market prices of these resources measure their opportunity values (because their prices reflect how much producers of other goods would be willing to pay for them), direct costs are the wages and salaries paid to faculty and other employees, expenditures on routine operating and maintenance supplies and services, and capital costs. Annual capital costs are usually considered to include depreciation and imputed interest on buildings and long-lived equipment, and imputed rent on land. As noted in the previous chapter, these capital costs are not accurately reflected in the usual budget statements of colleges and universities. In the statements, capital expenditures refers to the total expenditure for the purchase of buildings and equipment during a year. Not all this amount is true capital costs in any one year, because the property lasts much longer. The cost of using capital resources in any one year is better measured by the depreciation during the year, plus an estimate of the return the capital would earn in the best opportunity use. This opportunity return can be measured only imperfectly, but a reasonably good estimate can be made by multiplying some market interest rate, such as the rate of return on similar capital used in competitive industry, times the net (depreciated) value of the capital used. The imputed interest on buildings and equipment and the imputed rent on land are genuine costs of using these resources, whether the educational institution actually makes such payments to landowners and bondholders or not.[2]

The "indirect" costs of higher education are the labor earnings which a student must forego in order to devote himself to study. The student's own time and effort are resources with opportunity uses which must be given up if they are used in the educational process. In valuing them at the opportunity earnings they could command in some other use, we are merely being consistent with the use of market wages and salaries to value the other labor inputs included as direct costs. Studying can be regarded as one form of employment, with the compensation for the trouble of studying coming not in the form of money wages, but in the receipt of a capital good—the education. From the student's point of view, not working in the labor force means that he must sacrifice the consumer goods he could buy with the earnings, or someone else, like his family, or taxpayers, must sacrifice consumer goods if he does not. From the whole economy's point of view, the student's not working in the labor force means that what he could have produced there is lost; instead of those other things, what the economy produces with his time and effort is the education the student gets. Considering the annual wage which even young unskilled labor can earn in today's economy, it is apparent that foregone earnings cost is a very large part of total costs and can easily be more than half of it.

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[2] The rate of return used to impute the costs of capital used in education should be a "before tax" rate. For example, capital used in higher education is usually exempt from state and local property taxation. If the property were used in some other industry, it would have to produce a market value sufficient to pay property taxes, and the cost of higher education includes that alternative market value. Exemption of property taxes is thus one element of the public subsidy given to higher education, for even without any other subsidy the exemption means that institutions of higher education can offer the services of capital for a lower price than another industry which might use the same capital and which would have to pay property taxes. For the same reasons, the fact that higher education does not pay corporation profits taxes might be regarded as a subsidy. However, so many other activities escape the corporate profits tax that it seems odd to emphasize this as a subsidy to higher education; it is more common to emphasize it as a tax on the use of capital by corporations. But of course, a discriminatory tax on one thing is a subsidy to other things.

The questions of the correct measurement of cost in higher education are the same as some questions in the evaluation of public investment projects. The literature is enormous, but for a good discussion of the issues in the latter context, see Baumol, W., "On the Social Rate of Discount," *American Economic Review,* September 1968, pp. 788–802.

So far, nothing has been said of the living costs at college. Students living away from home must pay room and board costs. But those are not properly called costs of education if they would have to be borne regardless of what the young person is doing. Only the costs which are incurred *because the student attends college* are truly costs of higher education. If the living costs would have been incurred no matter what the student did—and this may cover most of the ordinary living costs—they are costs of the student existing, not of his getting an education. They would not be saved by the student doing something else, and so are not opportunity costs of education. However, some living costs are really higher because of attending college and are appropriately included in direct costs.

This should make it clear that the true costs of education cannot be identified by any particular total of money expenditures by students and colleges. Some real costs are not reflected in money outlays, and not all money outlays represent real costs. In practice, of course, it is exceedingly difficult to determine just what expenditures qualify as real costs. The determination depends on just how "education" is defined. If living away from home costs students more than commuting between home and college, but if living away from home is an important part of one's education, then the extra costs are properly considered costs of education. Other problems are raised by recreational and entertainment costs and research costs. To what extent are dramatic and athletic events considered a part of college education? Although such events are attended by some people not in college, the nature of the events and their setting may make them integral parts of college education. In research, there is temptation to distinguish it from education, but this requires making a distinction between discovering knowledge and imparting existing knowledge, which may not be a meaningful distinction. Even if they are distinguished, research needs public support as well as education, and it may be desirable to subsidize the same institutions to do both. Then the merit in distinguishing the two is that clear labeling of things aids intelligent decisions. At any rate, the questions which arise in defining education are difficult ones to which no firm answers can be given. However, they assume considerable importance when it comes actually to flushing out a practical public subsidy plan.

The total costs of higher education are direct plus indirect costs. They are thus all costs incurred by institutions for educational purposes, plus the part of costs incurred by institutions for housing and feeding students which exceed the costs the students or their families would have to pay anyway (including imputed rent, interest, and property tax on dormitories and dining halls), plus the food and lodging expenditures by students who live and eat off campus which exceed the living costs they would have to pay anyway.

One important difference between direct and indirect costs is that the direct costs vary greatly from institution to institution, while indirect costs do not. Indirect costs are the earnings which the student could make by not going to college; they are the wages he could command, given his ability, experience and previous education. These potential earnings forgone are probably not much affected by which college he goes to. Employers are not likely to be influenced by those decisions so the wage he is offered for participation in the labor force are little affected. On the other hand, the direct costs are much higher in some institutions than in others. This would be true even without subsidies, although the variation in the share of institutional costs recovered from the student is an additional factor. Ignoring the subsidies, the variation partly reflects the variation in the quality of education offered. Institutions of approximately the same size, thus equally able to achieve economies of scale, may incur widely different costs per student, because the resources they employ per student differ widely in quantity and quality. Some institutions employ high quality faculty, paying them the salaries and fringe benefits necessary to keep them, and also operate with a high faculty-student ratio; other institutions employ lower quality faculty at lower salaries and also employ fewer faculty per student.

In addition to the quality variation, the living costs which are marginal to higher education may vary with the institution attended, because whether the student lives at school or at home makes a difference.

Another important distinction is between social costs and private costs. Social costs are the opportunity value to the society as a whole of the resources used in higher education. If market prices equal opportunity costs, the costs talked about above will be the social costs. Private costs are less than social costs for two main reasons. Direct costs are less to the student than they are to the economy because of the extensive subsidies given by governments and by private donors to colleges and universities. These allow the educational institution to incur more costs than are reimbursed by students and their families. Private indirect costs are also less than social ones. Social indirect costs are the value of the student's potential earnings measured before income taxes are deducted. The value of a worker's social productivity in the labor force is measured by earnings before tax, because taxation represents merely a particular use of the economy's product, not a diminution of product. However, if he did work the student would have to pay income tax, and all he would have available for consumption is his earnings after tax. It is earnings after tax which the individual must sacrifice. Subsidies therefore reduce private direct costs, and income taxation reduces private indirect cost, below the social counterparts.

Private Benefits of Higher Education[3]

In the case of benefits, there is a crucial distinction between private benefits and social benefits. This distinction explains much of traditional economic policy in education.

EARNINGS

A major private benefit of higher education is the extra earning power it gives the individual. Human capital brings financial returns. It is partly in their additional earnings, over the earnings of persons similar in other respects but having less education, that the education pays off for the educated people. Table 2-1 shows some evidence of the private returns to education. In the first of the two we see a strong positive relationship between the income of a family and the education of the person who heads it (the data in Table 2-1 are based on a sample of 52,500 households). The correlation is unmistakable, even when color and age are held constant. On every single line of the table, the median income rises as the number of years of education completed rises.

TABLE 2-1.—*Median money incomes of families, 1967, by education of head*

Category	Years of school completed by head				
			College		
	8	12	1 to 3 years	4 or more	All families
All families, head 25 years old or more	$6,470	$8,822	$10,176	$12,672	$8,168
White	6,608	8,962	10,277	12,770	8,471
Nonwhite	4,397	6,665	8,189	10,485	5,232
All families, head 25 years old or more	6,470	8,822	10,176	12,672	8,168
Head aged 25 to 34 years	6,049	8,090	8,976	10,708	8,095
Head aged 35 to 44 years	7,599	9,281	10,628	13,631	9,239
Head aged 45 to 54 years	8,103	10,238	12,072	14,916	9,676
Head aged 55 to 64 years	7,091	9,272	10,917	15,163	8,042
Head aged 65 years or more	3,835	5,156	6,024	7,710	3,928

Source: U.S. Bureau of the Census, *Current Population Reports, Series P-60, No. 59, Income in 1967 of Families and Persons in the United States*, U.S. Government Printing Office, Washington, Apr. 18, 1969, pp. 42–44.

Naturally, it is socially significant that better educated families are better-off families. But the data have shortcomings for determining the pay-off to college attendance as an investment decision. A family's income includes not just the head's, so some of the variation in income may be due to varying participation of wives and other family members in the labor force. The figures include monetary income of working wives but not non-monetary benefits families receive from having educated women as homemakers. It is true that similar data for individual persons, as opposed to families, also show a strong correlation between income and number of years of school completed.[4]

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[3] For a thorough discussion of both private and social benefits, see Weisbrod, Burton A., *External Benefits of Public Education*, Princeton University, Princeton, New Jersey, 1964.

[4] U.S. Bureau of the Census, *Current Population Reports, Series P-60, No. 53, Income in 1966 of Families and Persons in the United States*, U.S. Government Printing Office, Washington, December 28, 1967, pp. 39–40.

Table 2-2.—*Median earnings for males in the experienced civilian labor force with earnings, 1959*

Category of worker	By years of school completed					
	Elementary 8	High school 12	College			All males [1]
			1 to 3 yrs	4 yrs	5 yrs or more	
All experienced males in civilian labor force aged 25 to 64	$4,474	$5,541	$6,119	$7,428	$7,968	$5,083
Aged 25 to 34	4,097	5,174	5,478	6,309	6,232	4,906
Aged 35 to 44	4,559	5,826	6,664	8,497	8,907	5,461
Aged 45 to 54	4,633	5,757	6,657	8,686	9,523	5,112
Aged 55 to 64	4,455	5,471	6,211	8,183	9,097	4,619
All white males aged 25 to 64	4,578	5,624	6,236	7,792		5,278
Aged 25 to 34	4,263	5,268	5,564	6,356		5,102
Aged 35 to 44	4,685	5,906	6,779	8,797		5,651
Aged 45 to 54	4,722	5,829	6,765	9,233		5,317
Aged 55 to 64	4,516	5,545	6,322	8,691		4,802
All nonwhite males aged 25 to 64	3,205	3,925	4,280	5,023		3,037
Aged 25 to 34	2,844	3,657	4,078	4,439		3,004
Aged 35 to 44	3,362	4,266	4,623	5,479		3,322
Aged 45 to 54	3,396	4,017	4,312	5,482		2,966
Aged 55 to 64	3,211	3,780	3,998	5,108		2,678

[1] Includes males who completed less than 8 years, not shown separately.

Source: U.S. Bureau of the Census *U.S. Census of Population: 1960. Subject reports. "Occupation by Earnings and Education." Final Report PC(2)-7B.* U.S. Government Printing Office, Washington, D.C., 1963, pp. 2-3.

But even that evidence does not meet another problem of interpretation of the data in Table 2-1, which is that the figures there include not just earnings—wages, salaries, and professional earnings—but all money income. Total income includes property income, relief payments, pensions, and the like. Therefore, it is not the relevant figure for assessing how well education pays off: it is earnings which really represent the returns to educational capital. Data on earnings are shown in Table 2-2. They come from a survey of five percent of the population taken as part of the 1960 Census. Because the returns to a woman's education often do not show up in monetary earnings, but rather in the improvements in the life of the family, table 2-2 covers only males. Again, education and earnings are correlated even when age and race are held constant.

However, no data on earnings differentials can present the whole picture. One problem is that while education pays off handsomely on the average, there is great variability in earnings. This variability may make many persons less than fully confident that education will pay off for them. I shall return to this point at length in this chapter, after dealing with other problems.

ESTIMATES OF RATE OF RETURN

There are two other major problems in interpreting the data. One is that added earnings alone cannot make education an attractive investment: the added earnings expected in the future must be discounted and then compared to the costs of education. The crucial question is how the rate of return on education compares to that for other investments. If a college graduate had added earnings of $500 per year for 40 years because he graduated from college, he might still regard the experience as unprofitable if it had cost him more than $20,000, including the earnings he had sacrificed; he would have earned a negative rate of return, in fact. Even if he earned $1,000 more a year for 40 years, his $20,000 would be earning less than 4 per cent (based on standard financial tables).

The other problem is that correlation is not necessarily causation: do the data show that educated people earn more because of their education, or only that they possess certain natural abilities and motivation which explain *both* greater educational attainment and higher earnings? Does the education really make that much difference?

Some economic studies have tackled these problems. Some of the conclusions from them will be summarized here, especially those from the best known of them, Gary Becker's *Human Capital*.[5] Becker estimated the rate of return to education beyond high school for various population groups in 1939 and 1949, years for which census data on earnings were available. Data did not permit separating college education from graduate education. Becker's rate of return is meant to be the rate for private pecuniary returns, so he based it on money earnings after tax and did not attempt to quantify external benefits. The costs of education on which the estimates are based are also the private costs to students, not the full costs of institutions of higher education.

Because the data covered both college and graduate education, Becker calculated costs for four and one-half years of attendance. Direct costs for tuition, books, and the added living expenses at college for the average student were estimated. The indirect costs for a year were estimated at alternative earnings for nine months. Indirect costs were 74 per cent of the total costs.

Becker's calculation of returns required estimates of the future earnings history of the 1939 graduates over their own lifetime. He assumed the earnings of different age groups of college graduates in 1939, after some adjustments, were reasonable estimates of how the 1939 graduates' earnings would rise as they themselves aged over time. The adjustments included one to reflect higher tax rates after 1939, and one to reduce the average earnings in each age group by the probability of not surviving to that age. He also assumed the earnings of both high school and college graduates would rise over time because of increasing productivity of labor in general; the earnings of both were increased by the same annual rate of growth, which meant the differences between them were increased.

Having estimated the future stream of earnings and the costs of investing in education, Becker calculated the rate of return. The result would be the return to a college education if the higher earnings were explained only by the education and nothing else. The result depends on which assumptions about future productivity growth, tax rates, and so forth are used, but Becker reports 14.5 per cent as probably the best single estimate of the annual return to the 1939 urban white male college graduates, and 13 per cent for the same group in 1949.[6]

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[5] Becker, Gary, *Human Capital*, National Bureau of Economic Research, New York, 1964. The following several pages summarize parts of Chapters IV and V of this work.

[6] *Ibid.*, pp. 77–8. These rates are calculated by the internal rate of return method, which is not easily explained without some background in the mathematics of discounting. See the appendix to this chapter. The calculations do not mean that in every year of the graduate's working life the extra earnings he received were 14.5 percent of the costs of education. The earnings advantage is not constant over the working life, but varies from year to year. In addition to the secular trend for productivity increases, the differentials are related to age; they increase with age until near the end of the working years, and then decrease a bit. Thus the differential would be less than 14.5 percent of the costs in some years but much more in others. The 14.5 percent is an average which weights the returns soon after graduation more heavily than the ones in later years.

There remained the task of adjusting these rates for the contribution of native ability, motivation, and other characteristics. Let us subsume all these under the word "ability." The typical college graduate has more ability than the typical high school graduate, so that the 14.5 per cent is more than would be earned by the average high school graduate if he went on to college. The essential problem is to estimate how much more a person with the ability to graduate from college would earn if he did graduate than if he did not.

Becker examined studies of the earnings of men in various samples taken as part of efforts to isolate the effects of college graduation from the effects of ability. These samples included one of college graduates employed in the Bell Telephone System; one of about 2,800 men who had graduated from high school 15 to 20 years before, collected by Wolfle and Smith for the Commission on Human Resources; one of men taken by the Survey Research Center, for whom information on earnings, rank in school, and other social characteristics was available; and a sample of pairs of brothers who shared many characteristics but had different levels of education.[7] Rank in high school was often used to indicate the ability of these persons.

From all these bits of evidence, Becker concluded that although the average college graduate is more able than the average of all high school graduates, college education is an extremely important element in transforming the ability into higher earning power. Men who had the ability to graduate from college, but did not do so, earned little more than the average high school graduate. In groups of men none of whom graduated from college, differences in ability seemed to make little difference for earnings, but in groups in which all graduated from college earnings were associated with ability. The greater ability of college graduates seemed to permit them to benefit more from college experience than the average high school graduate would have, but the college education was still crucial.

Becker therefore concluded that if a man did have the ability to graduate from college, he would have to go to college to earn more. The college education itself essentially explained almost all the extra earnings. For such men, he felt the correct adjustment for ability would reduce the rate of return hardly at all: the rates of 14.5 per cent and 13 per cent remained good estimates of the returns to education. The typical high school graduate, of course, has less ability to be transformed into earning power, and so his return from college would be less than this; Becker estimated it as about 12 per cent in 1939 and 11 per cent in 1949.

The conclusion that the educational experience itself, rather than other factors like ability and background, is the predominant explanation for higher earnings is supported by a more recent analysis by Weisbrod and Karpoff.[8] They analyzed a later sample of Bell System employees, about 7,000 male college graduates as of 1956. For each employee, earnings, rank in college graduation class, and years of service with company were known, and also a rough assessment of the quality of his college. By intuitive judgment of what his rank and quality of college revealed about a graduate's ability, Weisbrod and Karpoff concluded that only about one-fourth of the differences in earnings between high school and college men are attributable to differences in variables other than education (non-schooling variables). For example, the authors thought it reasonable to assume that men who graduated in the bottom third of their classes from average quality colleges have the same level of non-schooling variables as the average high school graduate. In the Bell sample, the earnings differential (over high school graduates) for such men was about 75 per cent as large as the earnings differentials for college graduates in general in the same occupations. Standardizing for other variables reduces the differentials by 25 per cent, therefore, leaving 75 per cent due to educational differences.

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[7] See Becker, pp. 79–88, for citation and discussion of the studies elsewhere in the literature where these groups are analyzed more fully.

[8] Weisbrod, B., and Karpoff, P., "Monetary Returns to College Education, Student Ability, and College Quality," *Review of Economics and Statistics*, November 1968, pp. 491–7.

Alternatively, one could assume that men who graduated from the middle third of below average colleges had ability equal to the average high school graduate; their earnings differentials were 82 per cent as great as for college graduates in general. Or, if one assumes the lowest third of graduates from below average colleges is the appropriate comparison group, one finds their earnings differentials over high school graduates were 69 per cent as large as the differentials for all college graduates. In view of these fractions, the authors suggest that 75 per cent is a reasonable estimate of the fraction of the differences in earnings which are due to education.

To return to Becker's study, he also estimated the rate of return to college drop-outs. The results of 9.5 per cent and 8 per cent for the 1939 students and the 1949 students, respectively, are important evidence on adjustment for ability differences. This is because drop-outs did not seem to have much higher I.Q.'s or high school ranks than high school graduates who did not enter college. Therefore, the returns to them are simply returns to a partial college education per se and do not need any adjustment. Becker also estimated the (unadjusted for ability) rates of return for non-white men; he found them to be 12.3 per cent and 8.3 per cent for the 1939 and 1949 groups, respectively, of typical college graduates.

NONPECUNIARY PRIVATE BENEFITS

Precise empirical analysis must be confined to monetary earnings, but it is clear that for many people education pays off in nonpecuniary terms as well as—or instead of—pecuniary terms. We know this because many people choose lifetime occupation like teaching and the ministry, which pay relatively little in monetary returns, but for which they must get a great deal of higher education. These non-pecuniary returns may be subsumed under the concept of earnings.

While the major emphasis in the economic literature on education and in this study is one the earnings benefits broadly defined, it is also generally agreed there are other benefits, although they are hard to measure. For one thing, there is the consumption benefit while attending college. A college education, in other words, is not entirely an investment which sacrifices the present to the future. As many college songs and alumni reunions suggest, it is also sometimes fun.

The relative size of consumption benefits is of some importance in the framing of public policy to subsidize higher education. How important they are depends on the aims of public policy. There may be a question of whether there are any immediate external benefits from college attendance, and in this troubled time many persons will strongly argue there are *harmful* external effects! Others regard the present system of protected dissent as an extremely desirable feature. The relative extent of private consumption benefits is also important. A major task of policy is to induce more higher education than the market would otherwise provide. Private earnings make many families willing to finance higher education on their own, and private consumption benefits merely increase this tendency. Subsidies to such families merely give a windfall, rather than being necessary to coax them to buy more higher education. This is all the stronger point if the consumption benefits, and thus the windfall gains, go largely to higher income families, because public opinion regards giveaways to the rich with more than the usual animosity if the giveaways finance consumption rather than investment. However, it is not clear just how much private investment in education is augmented merely because of the consumption benefits. One suspects it is rather limited if for no other reason than the enormous cost of the consumer goods involved.

Many people feel another aim of higher education subsidies is perhaps more important than the one of raising the aggregate real income of society by increasing the allocation of resources to education. They feel that aid to education is a particularly good way of altering the *distribution* of income in the long run, which can be accomplished by concentrating aiding investment by aid on lower income groups. To these people the existence of consumption benefits is of less concern, since the aims of increasing the consumption of lower income groups is a welcome byproduct of increasing the amount of educational capital they possess.

It is likely that a major part of the consumption value is derived from college experiences associated with the educational process, but not an integral part of it. Much of the "fun" comes from associating with other young people in various activities outside the classroom. If the public worries about the danger of subsidizing pure consumption, it can partially protect itself by limiting the kinds of costs it will defray.

Another non-earnings benefit which some might claim is that the educated person "enjoys life more." What this really means is that the educated person enjoys the life of the typical educated person more than a non-educated person would. The statement that being educated permits one to enjoy life more is empty of empirically verifiable content, since we cannot measure enjoyment very well. Casual empiricism suggests that the educated person certainly lives differently, and allocates his consumption expenditures differently, but that he may not really enjoy life any more.[9]

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[9] Weisbrod includes as private benefits what he calls two "option values." The "financial option" refers to the chance a person completing one level of education has to purchase a higher level, with the rewards the higher level can bring. Since college education is necessary for graduate education, college graduates possess this option. The "hedging option" refers to the educated person's ability to adjust to changing job opportunities. Weisbrod argues that average earnings do not fully reflect the value of this because added stability and security of earnings have an independent value to many people. Weisbrod, *External Benefits*, pp. 19–24.

External Benefits of Higher Education

As used here, the term "social benefits" encompasses the private benefits plus the "external benefits" of higher education. The external benefits of higher education are ones which increase the satisfaction of other members of society, but for which, as a practical matter, the educated person cannot be compensated. His education increases the welfare of all of society, but his own income does not reflect this. References to such benefits of education are common, but many writers do not feel that they can be attributed in significant amounts to *higher* education, but rather that they are much more a function of primary and secondary education.

For example, Friedman, using the term "neighborhood effects" for external benefits, writes:

> A stable and democratic society is impossible without widespread acceptance of some common set of values and without a minimum degree of literacy and knowledge on the part of most citizens. Education contributes to both. In consequence, the gain from the education of a child accrues not only to the child or to his parents but to other members of the society; the education of my child contributes to other people's welfare by promoting a stable and democratic society. Yet it is not feasible to identify the particular individuals (or families) benefited or the money value of the benefit and so to charge for the services rendered. There is therefore a signifiant "neighborhood effect." [10]

Friedman goes on to say that this refers primarily to primary and secondary education, and that the neighborhood effects of higher education are not strong. What external benefits higher education has come from its "training youngsters for citizenship and for community leadership * * * [but] the large fraction of current expenditure that goes for strictly vocational training cannot be justified in this way * * *" [11]

Kaysen distinguishes the various "outputs" of colleges and universities, noting that what is called higher education is not a single product, but a complex bundle of them: liberal education, preprofessional and professional education, applied research, fundamental research, and the preservation of knowledge and culture. The first and last of these are the ones with external benefits:

> Liberal education alone, stripped of elements of specific preprofessional training, is both an important individual consumer good and a social good as well. Many of the arguments that justify public provision of primary and secondary education can easily be extended to training in arts and sciences at the college level * * * [in the case of] basic scientific research and the preservation of knowledge and culture * * * no particular group of users short of society as a whole can be said to get the benefits of these activities, and therefore society as a whole should support them.[12]

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[10] Friedman, M., "The Role of Government in Education," in Robert Solo, ed., *Economics and the Public Interest,* Rutgers University Press, New Brunswick, New Jersey, 1955, pp. 124–5. A very similar statement is in his *Capitalism and Freedom,* p. 86.

[11] *Ibid.*, p. 134. Recently, Friedman has come to doubt even more that higher education has external benefits. See the article cited in chapter IV, note 10.

[12] Kaysen, Carl, "Some General Observations on the Pricing of Higher Education," *Review of Economics and Statistics,* Vol. 42, No. 3, Part 2 (Supplement: August 1960), pp. 56–57.

Weisbrod notes that wider education appears to develop a greater interest in political participation, for example in voting and discussion of political issues with an aim to influence the votes of others. This is a socially commendable result of education. He also notes that education permits the saving of certain social costs; general literacy and competence with arithmetic operations permits, for example, the substantial role of checking accounts and taxpayer-prepared tax returns, which permit the saving of real resources.[13] But again, it is doubtful whether higher education adds much to secondary education as far as these go.

However, in recent years, an external benefit which has attracted a great deal of attention is the favorable effect of education on economic growth, and this effect does seem to depend on college and university education. The key to the argument is the claim that the contributions of educated scientists, engineers, managerial personnel, etc., are not fully reflected in their monetary compensation. As Rivlin put it:

> * * * it is clear that highly educated people may make positive contributions to economic growth from which society reaps much of the benefits. They have ideas, do research, make discoveries, invent new products and processes and procedures. Usually, anyone can use these basic ideas and discoveries. It is because their originator may get little or none of the increase in income which they create that not enough people may be induced to invest in the expensive education which this kind of creative activity requires * * * Unfortunately—although it is easy to point to highly educated people who have made important contributions to national income for which they have received little personal remuneration—no one has developed a method of estimating the total return that society is getting, or might get, on its investments in higher education.[14]

Thus the importance of higher education for discovery and diffusion of new knowledge has been emphasized as a reason for crediting it with external benefits. One reason the benefits are external to the educated people responsible is that scientific discoveries of the most basic kind are not patentable, so that private profit cannot be protected by a legal patent monopoly.

The discovery of new knowledge and its rapid diffusion increase the productivity of all workers and capital in the economy, and thus the incomes of workers and capital-owners. Even a worker who does not possess a college education will find his productivity and income higher because some other people do have a college education, and have used their training to discover new knowledge. Some of the knowledge necessary for economic growth is so complex it requires training well beyond high school for its discovery and for its efficient incorporation into production methods. It is also possible that educational attainment increases the acceptance of new technology by lower levels of managment.

That these external benefits have been important has been suggested by authors of recent studies of modern economic growth in advanced countries.[15] The increases in labor and capital, measured in physical units, fall far short of explaining all the growth in income. What has happened is that the productivity of each physical unit—of each labor hour and of each machine—has increased greatly. Some of the increased productivity is due to increased education. Now, naturally, not all the increased productivity is to be considered an external benefit, for much of it has been reflected in higher earnings of educated people. But even after making allowances for the increased earning power of education in the market, there appears to be some additional element of growth, explained by education but not traceable to the education of specific people. This element is part of the general effect of the "advance of knowledge," to use Denison's phrase. How big a part remains unknown:

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[13] Weisbrod, *External Benefits*, pp. 25–26, 33.

[14] Rivlin, Alice, *The Role of the Federal Government in Financing Higher Education*, The Brookings Institution, Washington, D.C., 1961, pp. 135, 137.

> The proportion of the economic gain from new knowledge that the individuals or firms responsible for the advance can secure varies greatly. It is far larger for the sorts of knowledge that may be loosely described as patentable than for advances in either science or managerial technique. The scientists whose discoveries provided the basis for modern technology and the engineers who devised time and motion studies generally benefited, in a monetary way, only insofar as an accretion to prestige enabled them to place a higher price on their personal services than could others who quickly adopted their ideas * * *. More and better education would presumably contribute something to a more rapid advance of knowledge even without diversion of additional resources to research. In my classification of the sources of growth, this is a byproduct of education that affects the contribution of the advance of knowledge. How much of growth allocated to the advance of knowledge is an indirect consequence of improving education cannot be calculated, nor can the extent to which it could be influenced by accelerating the improvement of education.[16]

Rivlin has pointed out that if the external benefits of higher education in promoting the discovery and spread of new knowledge are realized by the economy through *organized research* by educated people, the proper public policy may be not to subsidize higher education, but to subsidize research. Although scientists cannot sell the fruits of basic research for high returns, they can sell their research activity in the market. If the government subsidized basic research, the salaries paid to scientists would be sufficiently high eventually to attract enough of them to become educated to the required degree and enter the field. These salaries would offer sufficient inducement, without direct support of the education of scientists. However, subsidies to science education might be a quicker way of subsidizing research, if potential students could more easily be made aware of the availability of financial aid than they could be made aware of their future salaries as scientists.[17] On the other hand subsidizing the education of scientists as a substitute for subsidizing research directly has some dangers. It may tend to bias the use of inputs in research, leading to the overuse of scientific labor and underuse of equipment and nonscientific labor in research.

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[15] For a survey, see Nelson, Richard: "Aggregate Production Functions and Medium-Range Growth Projections," *American Economic Review*, September 1964, pp. 575–606, which includes many references.

[16] Denison, Edward F., *The Sources of Economic Growth in the United States*, Committee for Economic Development, New York, 1962, pp. 251, 253. Denison points out that much of the knowledge which augments productivity in the United States originates in other countries. There are thus international external benefits of education.

[17] Rivlin, *The Role of the Federal Government*, p. 138.

Space remains for only a few more observations on external benefits. In a recent article, Schultz made the penetrating observation that the three main functions of higher education are instruction, research, and *discovering talent.*[18] The last of these is little talked about, although it is complementary in production with the other two functions and is traditionally carried on in the same institutions as they are. It is "a process which provides students with opportunities to discover whether they have the particular capabilities that are required for the type and level of education at which they are working." [19]

This activity has important social benefits. In attempting instruction, groups of faculty and students together discover talents, but there is no practical way of compensating the students, especially the ones which turned out to have no talent, for their services in the endeavor. Subsidies are thus necessary to induce students to "try out" college so that society can uncover the talent of the ones who would not otherwise go to college. It may be that many of the discovered students will earn enough later in life to pay the full cost of their education, and enough that society feels they *should* pay the full cost, but they would not have come to that situation if they had not been induced to try college in the first place.[20] This has implications for a subsidy plan. Perhaps the freshman year should be more highly subsidized than later years. The problem may be viewed as one of reducing the risk to prospective students of spending money and time at college, which view suggests that in addition to any general subsidy extended the fees charged for the freshman year should be retroactively lowered for those who *fail.* This no doubt is paradoxical to those who feel higher education should reward the intelligent and motivated students who succeed. But it is consistent with the view that the *market* will reward those who succeed, and that the problem is to overcome the inhibitions many young persons have about investing time and money in discovering more about their own abilities. Society may well gain more in uncovering hidden talent than it loses in wasting resources on those who had no talent to be uncovered.

In the end education's external benefits cannot be exactly calculated, neither the benefits of a "better society," nor the economic benefits of more rapid growth. Some would undoubtedly consider some of the actions of typical educated people as imposing harmful external effects on other people. But there seems to be general agreement that the net external effects are favorable, so that sole reliance on private decisions based on private benefits and private costs will cause the loss to society of investment which is worthwhile to it, but not worthwhile to the individual. It is clear, however, that a large part of education's benefits *are* private, and that society can reasonably expect individuals to finance a significant part of the costs, because they get a significant part of the returns. This is a reasonable requirement even for some low-income families, who could often at least sacrifice foregone earnings, although the exact fraction they should contribute from their own resources will depend on income distribution goals.

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[18] Schultz, Theodore, "Resources for Higher Education: An Economist's View," *Journal of Political Economy,* May/June, 1968, pp. 327–47.

[19] *Ibid.,* p. 331.

[20] *Ibid.,* p. 345.

There is one final point, one of terminology. Some writers include in external benefits something like social justice or the equality of opportunity [21] which is achieved by assisting the attainment of education by youngsters who are qualified but prevented by circumstances from getting it. While equality of opportunity may be one of the main goals of educational policy, I do not include it as an external benefit. I use the term "external benefits" to cover the productivity and welfare effects just discussed, but not to include favorable changes in the distribution of income. The definition of external benefits is partly a matter of taste, but I keep the two goals of correcting for external benefits and improving the distribution separate, because I think the latter requires stronger value judgments than the former. The role of value judgments ought to be kept explicit, even though in this case they are accepted by many. However, chronic violation of equality of opportunity may engender social unrest which reduces productivity. If so, insuring equality of opportunity will have some external benefits even in the sense I use the phrase.

THE INVESTMENT DECISION

The fact that some of the benefits are external to them means that individuals will make less investment in education than is desirable for the society as a whole, unless subsidies are given. An individual will not make some investments which for the economy would more than repay their costs, because they do not repay their costs for him.

The choices which are influenced in this way include many different kinds of decisions on how much education to buy: to go to college or to work; to finish college or drop out; to go on to graduate school or to work; to go full-time or part-time; to go to a high quality school or a low quality school. For many families, these decisions may be seen as more a matter of real choice when daughters rather than sons are involved.

In this section I briefly outline how the effects of external benefits fit in the traditional investment theory of economics, and also the effects of income taxes, which have rather unusual aspects as far as investment in education is concerned. A more technical treatment of the investment decision, using simple mathematics and some arithmetic examples, can be found in the appendix to this chapter. The discussion here ignores the inhibiting effects of uncertainty, which are treated more intuitively in the following section.

The family pondering an investment which pays off only in the future will discount the future returns and then compare their present value with the cost of the investment. If the discounted present value is greater than the cost, it will decide to make the investment. The rate of interest it uses to discount the future will depend on its particular circumstances and opportunities and will not be the same as for all other families. The rate may be an average of several rates if it finances the cost in several different ways. If it borrows money to attend college, the rate of interest on the loan is relevant. If it sacrifices other investments by cashing in securities or curtailing savings, the rate which could be earned on them must be weighed in. If it must postpone consumption or housing investment, the proper discount rate is the implicit rate of return, in terms of satisfaction or utility, which could be earned by having the sacrificed goods sooner rather than later. The fact that families are willing to pay very high rates of interest on installment credit, often 18 per cent or more, shows that the implicit rate of return is high. As a special case of postponed consumption, the family may give up leisure or the mother's services in the home; college educations often are partially financed by the mother working for a few years,[22] or the father working longer and/or harder. And, of course, in some cases, one member of the family sacrifices his own education for another's.

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[21] E.g., Rivlin, in *ibid*, pp. 131–133.

The private investor must base his decision on private costs and returns. Assume for the moment no subsidies are available to reduce costs. Then externality of benefits makes the present value of private benefits lower than the present value of total benefits. Some investment which would be worthwhile in the sense that the present value of total benefits exceeds cost, is not undertaken because the cost exceeds the present value of private benefits. Society could restore incentives by offering a subsidy to reduce cost, for that would reduce the cost below the present value of private benefits. And in practice, defrayment of costs is the way government proceeds to subsidize education. In theory, it is possible to take another approach, of government's augmentating the incomes of educated people *after* they are educated, but this is not done. Much of the external benefit of higher education comes about only if the educated work, making it necessary to preserve incentives to work. If using post-education payments eroded these incentives, the external benefits might not be reaped by society after all.

What additional complications does the income tax introduce? Like external benefits, taxes on money income reduce the private returns to investment and thus lower their present value. This is true of all investment, whether in higher education, in securities or in physical capital, assuming the tax is not shifted by the investor. However, in the case of education it may be that more of the returns are nonpecuniary and thus non-taxable.

An education and a piece of physical capital are like each other, and different from a security, in that they depreciate over time. It is useful, therefore, to point out some differences in the ways our tax laws treat education and investment in physical capital, which we may call "business investment" for convenience. If the tax laws allow deductions for depreciation expense over the life of the asset, the effect of taxation is less, but is not eliminated: the ratio of discounted returns to cost is still less than it would be if there were no tax on returns at all (see appendix). The tax on returns would be completely neutralized only if the total cost of the asset was fully deductible from income in the year it was bought (which would mean negative taxes for some persons, since the cost of an asset often exceeds current income by a large margin). Even then, it would be neutralized only if the tax rates in that year were no lower than the rates applying to future incomes, which the progressivity of the tax structure makes unlikely.

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[22] For information on this and on the general pattern of financing by families, see Lansing, John B., *et al.*, *How People Pay for College*, Survey Research Center, University of Michigan, Lansing, Michigan, 1960, chapter III–B.

What is interesting is the differences in depreciation allowances for educational investment as compared to business investment. For business investment, the cost of the asset is deductible in full, but only gradually over the life of the asset. For education, direct costs—tuition and extra living expenses—are not deductible at all if they are paid for general education, neither immediately nor eventually as depreciation. On the other hand, the indirect costs are in a sense fully deductible immediately. These are the foregone earnings, and it is as if they are deductible because the income tax is levied only on actual earnings, not on potential earnings. The effect of taxation is to reduce the foregone earnings to the individual, because he considers only after-tax earnings as costs. So some costs are treated less favorably than the costs of business investment, but other costs are treated more favorably. Therefore, the present tax treatment does not bias against higher education relative to business investment as much as is often assumed and perhaps not at all in some cases.[23] If a person received a scholarship to defray all direct costs, leaving foregone earnings as his only cost, the taxation of his future earnings would be neutralized by the exemption of foregone earnings from tax, as long as the tax rate were to remain constant over his whole working life (see appendix).

Thus, compared to, say, sales taxes or other consumption taxes, income taxes bias individuals against both educational and business investment relative to current consumption, but it is not clear whether it biases them against educational investment more than business investment. In addition to the complication introduced by foregone earnings, there is the added one that the taxes on business investment income are probably more easily shifted than the taxes on personal income, which would make a greater bias against educational investment more likely. Neither is the role of external benefits clear, since as we saw earlier business investment may have important external benefits too. The entire picture is very clouded.

Some persons, but not all, must pay higher tuition if they want a higher quality education. This is important in view of our tax laws, because tuition is not tax deductible. The present tax situation thus presumably gives people less incentive to incur tuition costs than to incur the costs of foregone earnings, since the cost of foregone earnings are reduced by taxation. This means that the present tax laws encourage attendance at college but not at high quality ones. Since extra living costs are not deductible either, the laws also do not encourage certain other kinds of college experiences, such as living away from home.

RISK AS A LIMITING FACTOR TO PRIVATE INVESTMENT

College education is a risky investment. There is some risk in getting an adequate earnings return on a completed college education, but perhaps even more risk to starting college attendance in the first place. The latter risk includes both the former risk and the additional risk of spending some preliminary time in college without being able to complete college due to financial or other reasons.

Policies to reduce the barriers to investment raised by uncertainty have been widely discussed in recent years. A prominent feature of the discussion has been recognition that government has a responsibility to reduce the risk even of investment by relatively high income families, even if outright subsidies to them are not necessary or appropriate. Suggestions for public policies will be discussed in detail later in this paper, but some overview of the problem is desirable here, because it has implications for all forms of public aid to higher education.

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[23] This point is discussed by Gary Becker in *Human Capital*, p. 149.

Table 2–3 presents some data on the variability from person to person in 1959 of the additional earnings received by college-educated persons. It shows that even college completion did not guarantee large monetary returns. Now, of course, some of the variability has nothing to do with uncertainty, because it is due to variation in well-known and quite predictable factors. The data in the table hold age constant, but a lot of other things are known to affect earnings, and their role is appreciated in advance. Many people will have some idea of how those things affect them. Ability, geographical location, and the access to "contacts" are examples. One of the biggest reasons for variation in monetary earnings is that in some careers a larger proportion of total income is psychic income than in others. This is well-known to those pondering the decision. As long as the prospective student knows that in some occupations he will be able to balance the lack of monetary rewards by nonmonetary ones, he will be less frightened by the variability shown in the earnings distribution covering all occupations.

But even after making these adjustments, considerable variability remains. How much cannot be quantified, as we have no data holding constant all relevant factors simultaneously, especially race, age, occupation, and ability. In other words, influences unknowable in advance, including pure chance, cannot be isolated in the data. The chances for much below average returns seem high enough to make at least some people reluctant to risk the large costs of college. The possibilities of early death, disability, or just plain bad luck must be thought of. They would reduce earnings whether one had a college education or not, but at least the sacrifice during the college years will not have been made if college is passed up. Lifetime income advantages are often cited to encourage college attendance. But the income from joining the labor force immediately will undoubtedly look safer to many younger persons.

TABLE 2–3.—*Frequency distribution of 1959 earnings of males in the experienced civilian labor force*

Years of school completed	Total	Percentage distribution by earnings					
		Less than $3,000	$3,000 to $4,999	$5,000 to $6,999	$7,000 to $9,999	$10,000 to $14,999	$15,000 or over
All males, aged 25 to 64	100.0	20.5	28.1	28.7	14.4	5.2	3.1
8 years	100.0	25.2	34.7	27.5	9.5	2.1	1.0
12 years	100.0	12.1	26.8	35.7	17.9	5.1	2.4
1 to 3 years college	100.0	10.9	20.7	31.3	21.9	9.7	5.6
4 years college	100.0	7.3	13.8	25.1	26.7	16.6	10.5
5 or more years college	100.0	9.2	11.6	21.3	24.4	17.6	15.9
All males, aged 35 to 54	100.0	18.5	26.3	29.0	16.0	6.3	3.8
8 years	100.0	23.1	34.6	29.1	10.2	2.1	.9
12 years	100.0	10.5	23.6	35.9	20.7	6.3	3.0
1 to 3 years college	100.0	8.2	17.1	29.6	25.4	12.4	7.3
4 years college	100.0	5.4	9.6	20.5	28.0	22.1	14.5
5 or more years college	100.0	5.7	8.0	18.3	25.5	21.2	21.3

Source: U.S. Bureau of the Census, *U.S. Census of Population: 1960. Subject Reports. Occupation by Earnings and Education. Final Report PC(2)-7B.* USGPO, 1963, pp. 2-3.

Of course, while there are chances for returns well below average, there are chances of unusually high returns as well; won't these offset the chances for unusually low ones? Probably not. It is a widely held assumption that variability itself, even though in both directions, is something people will shun if an alternative with the same average result but less variation is available. For example, assume the best guess of the rate of return for one investment is 10 percent, but there is some uncertainty: a considerable chance the rate will be as low as 5 or as high as 15 percent. Assume another investment promises a guaranteed rate of 10 percent. Theorists commonly assume the chances of 15 percent are not enough to overcome the chances of 5 percent, so investors will prefer the second opportunity—they will be "risk averters." Although it is known not to apply to all investors, this assumption is based on observed differences in interest rates on assets of different risk; the average rates of return on riskier investments must compensate for their greater variability by having a higher expected rate of return.

If a group of persons invests in education, the total returns to the group may be high, but the returns to any one member quite low. When the returns to the whole group are totalled up, after the fact, above-average returns to some members will offset the below-average returns to others, leaving the high average. But when decisions are made, no member of the group can know if he will wind up above the average or below it, and the possibility of being well below it will deter investment. Many members may feel this way, and so few risk the investment. Thus investment which would have produced very satisfactory returns is not made.

If education is partially financed by borrowing, both borrower and lender face risks. The returns to education may be so low that the borrower cannot meet the interest and repayments on the loan. A lender can cope with this by diversifying his lending, and charging on each loan a rate of interest somewhat higher than actually required to cover costs and profit on that particular loan. The excess rate on the loans which are eventually paid off covers the losses on those which are not, leaving the lender enough to cover costs and profit on the whole pool of loans. The lender must be able to predict accurately the fraction of loans which will go sour; an experienced lender can do this by making a large number of loans if the payment prospects for each are independent of each other.

It is harder for the borrower. He can hardly pool capital in many different educational investments. Even if his lender is protected, the borrower himself is always left with the legal and personal embarrassment of failure to repay. And the ways in which the lender protects himself naturally raise the interest cost to the borrower.

Furthermore, it is difficult to borrow to cover the indirect or foregone earnings costs of education, except at the very high rates of interest on consumption loans, which must be repaid in a short period of time. The risk of not recovering the foregone earnings therefore rests heavily on the student and his family. Some lower income families may be able to sacrifice the young person's earnings only if they can count on his higher income later. Even where he has no explicit obligation to repay them, the young person undoubtedly feels the burden of showing the parents' investment has paid off in some sense or other. This obligation must make some young people hesitant about incurring it.

The public sector, therefore, should count on more than subsidies to persons undertaking higher education. Subsidies would be needed for many families even if the returns to education were certain, because some of the returns to society are external to the individual. Beyond this, some kind of insurance is desirable to reduce the additional inhibiting factor of risk. The two kinds of public action may be combined, by extending some outright subsidies and also insuring families against losing the *remaining portion* of costs they must finance out of their own resources. Insurance means reducing the possibility that those who fail will lose their own resources; subsidy means paying outright some costs even for those who succeed.

How do we determine whether insurance is actually desirable? Assume society has already extended subsidies, and then contemplates an insurance scheme. The insurance will induce some new educational investment which would not otherwise have been made (that is, which subsidies alone would not induce). Some of the new investors will succeed, some will fail. The costs of the insurance scheme are the losses on educating those who fail—they are the amount by which returns fall below costs. The gains of the scheme are all the returns to the successful. As long as the costs are less than the returns, the scheme is worthwhile. This will be the case if the failure rate is low and/or the returns to the successful are high. The argument for an insurance scheme must rest on the assumption that in the group which responds to it, many of those who succeed to a great extent would not have had enough confidence in themselves to invest without insurance.

While this is the test the insurance plan should pass, it must be noted that the budgetary balance of the plan may be determined on quite different grounds. A plan which is socially worthwhile may in fact be run at a loss, if the successful persons themselves are not made to bear the costs of those who fail. It would make some sense perhaps to require that successful participants cover the costs, and many would be perfectly happy to do so, just as they cheerfully pay for fire insurance, but this is not necessary for a scheme to be a good one.

COSTS OF BORROWING

Given the nature of investment in human capital, it should not be surprising to find rather high costs, including interest and insurance, of borrowing to finance college education in the absence of government insurance and subsidies. At least this is true when the "true annual rate" of interest is considered. (The true rate would equal the stated rate if the stated rate were charged only on the outstanding balance.) The true rate is often much higher than the stated rate, a fact now well-known from discussions of "truth in lending." In the absence of a public guarantee system, most commercial lending plans have required repayments to begin immediately after receiving the loan, and most feature a 6-year repayment period (which means the loan must be wholly repaid by two years after college is completed).[24] In addition, not all the principal itself is advanced right away, but rather in semester installments. Since both advances and repayments are in installments, the actual balance outstanding at any one time is quite low.

A survey several years ago, before expanded Federal efforts in insuring loans, of a number of commercial loan plans for financing college education revealed that true annual rates of 10–20 percent were common, and some actually had much higher true rates.[25] One well-known plan offered loans of $500 per semester for four years, or a total of $4,000, to be repaid in 72 monthly installments of $66.96 each. The plan included insurance on the borrower to provide funds for completion of study by the student in case the borrower died or became totally disabled. The total amount repayable was thus $4,821.12, or $821.12 over the total principal. This appears a rather small charge for a six-year loan of $4,000 but the true annual rate was actually over 15 percent.[26] Another plan provided for 60-month repayment of the $4,000 plus a service charge (including interest and insurance) of $398, working out to a true annual rate of about 23 percent; still another had 40-month repayment and a service charge of $240, giving a true annual rate of about 60 percent.[27]

These annual rates include insurance premiums and so are not true rates of interest alone. Furthermore, lenders must cover investigation and accounting costs as well as profit. They are not necessarily cases of usurious loans, but they do show that the costs of non-subsidized borrowing can be a great burden for low-income families.

TECHNICAL APPENDIX: THE INVESTMENT DECISION, EXTERNAL BENEFITS, AND TAXES

First, we have the rule for determining the present value of a stream of annual benefits received over n years in the future, discounted at a rate of interest i:

$$\text{Present value} = V = \frac{B_1}{(1+i)} + \ . \ . \ . + \frac{B_n}{(1+i)^n}$$

B^i is the benefit received i years from now, calculated before deducting depreciation on the capital asset which produces the benefits.

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[24] U.S. Office of Education, *Borrowing for College: A Guide for Student and Parents*, U.S. Government Printing Office, Washington, 1965, *passim*.

[25] True annual rates were calculated for many different plans in a study quoted in U.S. Congress, Senate, Committee on Labor and Public Welfare, Hearings, *College Student Aid Legislation*, Part 1, 88 Cong., 2nd sess., United States Government Printing Office, 1964, pp. 89–91. Although interest rates were not calculated, total loan costs for some plans are also quoted in U.S. Office of Education, *Borrowing for College*.

[26] U.S. Congress, *College Student Aid Legislation*, p. 89. Why the true rate can be so high can be better appreciated by calculating the net outstanding balances, or amounts actually available to the borrower, at various times under such plans. As an example, assume a plan under which $500 is advanced each six months beginning July 1, 1969, and monthly repayments of $66.96 begun on July 31, 1969. At no time during the first six months would the outstanding balance exceed $500, and by December 31, it is only $98.24. On January 1, 1970 it jumps to $598.24, then falls steadily again to $196.48 on June 30, 1970. The maximum balance, in fact, is $1187.68, on January 1, 1973; by then $4,000 has been advanced and $2812.32 repaid (42 installments at $66.96 each). The net balance then declines continually, reaching zero on June 30, 1974.

[27] *Ibid.*

The investor compares this present value to the cost of an asset. If $B_1=B_2= \ . \ . \ . \ =Bn=B$, so that the annual benefits are constant, the formula happens to be a simpler one:

$$V=\frac{B}{i}\left[1-\frac{1}{(1+i)^n}\right]$$

This case of constant annual returns is the one dealt with here, although the returns to education are not really constant in this way. Some conclusions are not affected by this simplification. Financial experts will recognize this formula as the one for the present value of an annuity of B per year for n years. As n gets larger and larger, the term in brackets becomes closer and closer to 1, and V closer to B/i, which is the present value of a perpetuity.

To simplify the notation, define the term A:

$$A=\frac{1-\frac{1}{(1+i)^n}}{i}$$

Then,

$$V=AB$$

Let B_s be the annual benefits to society as a whole, what I have called the social benefits. Assume that some fraction, e, of them is external to the individual. Then the private benefits are:

$$B_p=(1-e)B_s$$

B_p is the increase in income the educated person can expect from investing in his education. Then the present value of these private benefits, V_p, will be only $100(1-e)$ per cent of V_s, the present value of the social benefits:

$$\begin{aligned} V_p &= A(1-e)B_s \\ &= (1-e)V_s \end{aligned}$$

This relationship would also hold if the B's were not constant from year to year. The effect of external benefits is thus to reduce the private present value by the fraction e, compared to social present value. If $e=.2$, for example, an educational investment may have \$1.10 of social present value per dollar of cost, and thus be clearly worthwhile, but will have only 88 cents private value per dollar of cost, and therefore not be worthwhile to the individual. The bias can be eliminated by offering the prospective investor a subsidy, equal to $100e$ per cent of the costs incurred. If total costs are C_s, private costs are then lowered to

$$C_p=(1-e)C_s$$

and the private present value per dollar of costs is the same as if there were no external benefits:

$$\frac{V_p}{C_p}=\frac{(1-e)V_s}{(1-e)C_s}=\frac{V_s}{C_s}$$

Any investment worthwhile in the social sense will then be worthwhile in the private sense.

This has ignored tax effects. Assume the potential student estimates his future income tax rate to be the fraction t, and that it does not vary with income, and that there is no subsidy. Under present U.S. practice, "depreciation" of education is not a deductible expense, so that the future private after-tax benefits will be simply $(1-t)B_p$ per year, and their present value will be

$$V'_p=A(1\text{-}t)B_p=(1\text{-}t)V_p=(1\text{-}t)(1\text{-}e)V_s.$$

$$V'_p=V_s-(t\text{-}\mathrm{e}+et)V_s$$

This assumes all of B_p is taxed, which assumes it is made up wholly of extra earnings. If part of B_p is non-pecuniary income, the effect of taxes would be less.

Therefore, when both external benefits and taxation are present, private present value will be 100 $(e+t-et)$ per cent below social value. However, taxation affects private *costs* as well. The foregone earnings part of cost, or the indirect cost, is not taxed, since only actual earnings are taxed, and not potential earnings. For each dollar of foregone earnings, only (1-t) dollars is actually lost to the individual, since if he had worked that is all he would have had anyway. The social cost is the full dollar, of course, so private costs are less than social costs. If F is foregone earnings before tax, and D is direct costs, then social cost is

$$C_s=F+D$$

and private cost is

$$C'_p=(1-t)F+D$$

If $F=fC_s$, where f is the fraction of total cost which is indirect, taxation reduces the private cost by the fraction tf:

$$\begin{aligned}C'_p&=(1-t)fC_s+(1-f)C_s\\&=fC_s-tfC_s+(1-f)C_s\\&=C_s-tfC_s\end{aligned}$$

This reduction in cost helps offset the bias caused by the reduction in present value, but does not offset it completely if there are any direct costs. The fractional reduction in present value, $(e+t-et)$, is always greater than in cost, tf, as long as the fractions e, t, and f are greater than zero and less than one. If $e=.2$, $t=.2$, and $f=.75$, for example, private costs are 15 per cent below social costs, but private benefits are 36 per cent below social benefits: 20 per cent due to external benefits and another 16 per cent due to taxation. The individual's after-tax value per dollar of costs is:

$$\frac{V'_p}{C'_p}=\frac{V_s(1-t)(1-e)}{C_s(1-tf)}=\frac{V_s}{C_s}\cdot\frac{(1-t)(1-e)}{1-tf}$$

The ratio V'_p/C'_p is always less than V_s/C_s.

The effects of income taxation would be completely neutral if all private costs were foregone earnings and there were no direct costs.

For then $f=1$, and the last result would be:

$$\frac{V'_p}{C'_p}=\frac{V_s}{C_s}\cdot\frac{(1-t)(1-e)}{1-t}=\frac{V_s}{C_s}(1-e)$$

with the tax having no influence.

It has been proposed [28] that direct costs be deductible from income, for tax purposes, over the life of the education. This would permit depreciation expense to be deducted from taxable income, as it can be for physical capital. This would leave unchanged social costs, social value, and private costs, but would increase private benefit by the tax reduction gained by deducting depreciation from income. Assuming straight-line depreciation, the annual deduction is D/n, and we have:

$$\begin{aligned} V''_p &= A\left[B_p - t\left(B_p - \frac{D}{n}\right)\right] \\ &= A\left[B_p(1-t) + t\frac{D}{n}\right] \end{aligned}$$

Obviously, V''_p exceeds V'_p by an amount equal to AtD/n, showing that deductibility of depreciation restores some of the private value lost through taxation. But V''_p cannot rise by enough to make V''_p/C'_p as large as V_p/C_p, the ratio achieved with no taxation at all. If n and i are large, in fact, V''_p will be very little bigger than V'_p, because so many of the deductions come far in the future and have a low present value.

If the income tax is progressive, and if the investor expects future income to be higher than his opportunity earnings are now (partly because of the education), the tax rate relevant to the B_p's will be higher than the one relevant to F. This will reduce the ratio of value to cost even more than proportional taxation does.

As a convenient summary, here are the ratios of value per dollar of cost which have been discussed, in descending order of size rather than order of presentation. All ratios apply to a particular example, in which $B_s=\$1{,}000$; $e=.2$; $t=.2$; $F=\$3{,}500$; $D=\$1{,}500$; $n=40$; and $i=.06$.

Example 1. $\frac{V_s}{C_s}=\frac{\$15{,}046}{\$5{,}000}=3.009$, the ratio with no external benefits and no taxes, equal to social value per dollar of social cost.

Example 2. $\frac{V_p}{C_p}=\frac{\$12{,}037}{\$5{,}000}=2.407$, a ratio, 20 per cent lower, that is the private ratio of value per dollar of cost if there are external benefits but no income taxation.

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[28] Goode, Richard, *The Individual Income Tax*, The Brookings Institution, Washington, D.C., 1964, pp. 82–93.

Example 3. $\frac{V''_p}{C'_p}=\frac{\$9{,}743}{\$4{,}300}=2.266$, the ratio of private value per dollar of private cost, if there are both external benefits and income taxes, but direct costs are deductible from income as straight-line depreciation over the 40 years.

Example 4. $\frac{V'_p}{C'_p}=\frac{\$9{,}630}{\$4{,}300}=2.240$, the same ratio as the last one, but with no present or future deductions for direct costs.

ANOTHER APPROACH

Instead of examining present values, one can calculate the "internal rate of return" of an investment. The internal rate, *r*, is the interest rate, which when used to discount the future benefits, makes the present value of benefits equal to the cost. While the previous approach computed present values at some given interest rate, the internal rate calculation produces an interest rate of its own, the one at which the investment would be just barely worthwhile. The *r* is the value which solves the equation:

$$C=\frac{B}{r}\left[1-\frac{1}{(1+r)^n}\right]=BA_r.$$

Here, A_r is used to emphasize that the present value factor A depends on what r solves the equation, and varies from case to case, unlike the previous A. As n increases, r tends toward B/C, the internal rate for a perpetuity of B per year.

A proportional reduction in B very nearly reduces r by the same proportion, although not exactly. For long investments (n large) that yield high internal rates, proportional reduction in r is a very good approximation. The internal rates, rounded to nearest .1 per cent, are as follows for the four numerical examples just used, with subscripts the same as there:

Example 1. $r_s=19.9$ per cent, since $5{,}000=(100)(A_{.199})$
Example 2. $r_p=15.9$ per cent, since $5{,}000=(800)(A_{.159})$
Example 3. $r''_p=15.0$ per cent, since $4{,}300=(647.50)(\mathrm{A}_{.150})$
Example 4. $r'_p=14.8$ per cent, since $4{,}300=(640)(A_{.148})$

III. EDUCATIONAL CAPITAL AND THE DISTRIBUTION OF INCOME

Just as recent studies have highlighted the importance of educational capital for the growth of the national economy, other researchers' results have shown how important the possession of educational capital is in determining personal income. This is not surprising. Despite the considerable "external" benefits of education, a large part of the total social return does show up as increased earnings of educated people, so the distribution of income will partly reflect the distribution of educational capital. An individual should regard educational capital as inherently as good a candidate for investment as tangible physical capital or as securities representing ownership of physical capital.

In the analysis of growth it is emphasized that educational capital is only one kind of "human capital," and this point must be made in discussing income distribution as well. The earning power of a person depends not just on his education, but on his intelligence, motivation, physical strength, health, etc. While these all have some independent effect, they also interact with education in the creation of earning power, because people with a generous supply of them can benefit more from education. It should also be mentioned again that the income earned is not all monetary income: leisure and psychic income are other ways in which an educated person can reap the returns from his capital.

THE DISTRIBUTION OF EDUCATIONAL CAPITAL IN THE POPULATION

The distribution of educational capital can first be surveyed with Census data on the educational attainment of the population, as measured by *years of school completed*. As shown a bit later, years has shortcomings as a unit, but it provides a start.

Chart 3–1 shows the distribution as of March 1968. These data are based on one of the Census Bureau's Current Population Surveys covering about 50,000 households. The general shape of the distribution agrees with the corresponding results from the 1960 Census, in which information was collected from a 25 percent sample of the population.[1] Of course, in 1960 the distribution was somewhat to the left of the current one.

Chart 3–1 shows the distribution for persons aged 25 or more and also for those aged 25 to 29. The latter distribution is more relevant to current issues because it more closely reflects contemporary educational aspirations. The difference between the two distributions does show the significant changes over the last several generations. In fact, even the cohort aged 25–29 is too old to reflect the rapid changes in college attendance. The 20–24 age group better reflects the trend to at least *starting* a college education, although it is too young to show accurately the trends in finishing college and doing graduate work. However, the Vietnam War has some impact on the statistics. The Census survey data do not include single men living on military posts. There were many such men in March 1968, and also serving abroad. Due to college deferments, the men in military service probably contained a smaller fraction of people who had started college than the population as a whole of the same age. In the group aged 20–24 who were included in the survey, therefore, the proportion who had started college was larger than in the whole population, so that the data for them overestimate the trend in starting college. However, with that warning, here are the percentages of various age groups which had completed one year of college or more by March 1968: 20.1 per cent of

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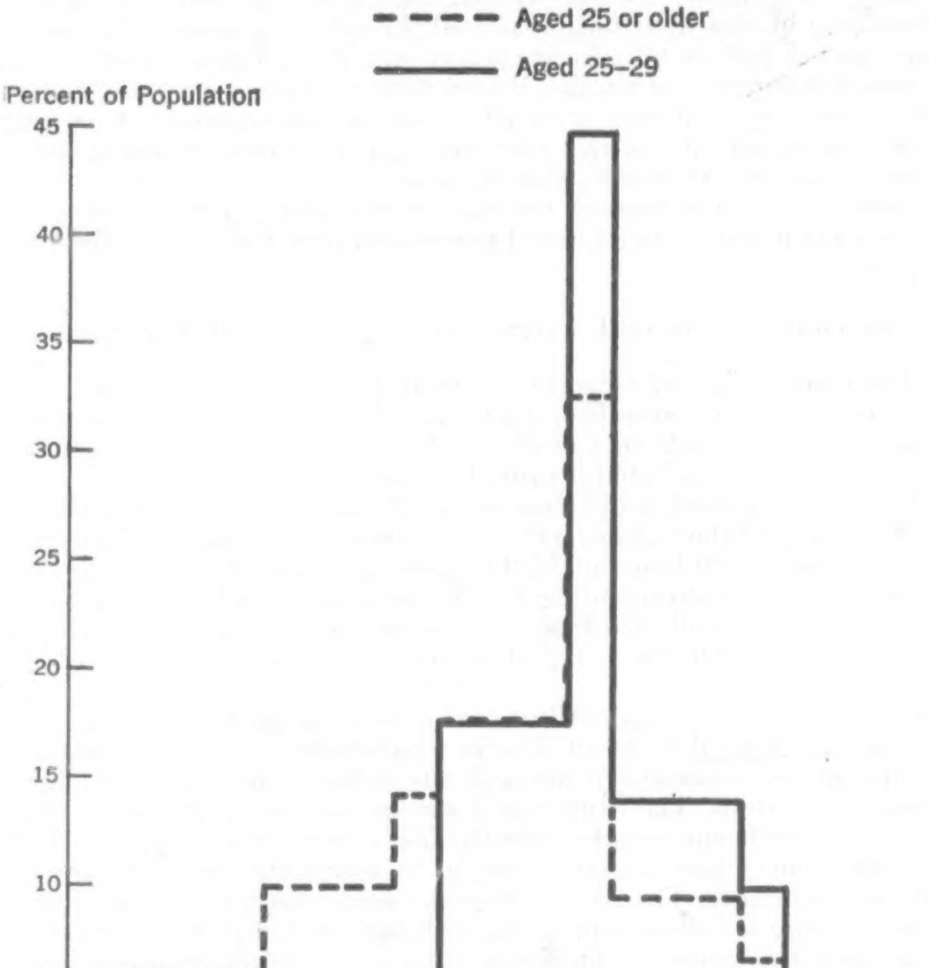
[1] U.S. Bureau of the Census, *U.S. Census of Population: 1960*, Vol. I, *Characteristics of the Population*, Part I, *United States Summary*, U.S. Government Printing Office, Washington, 1964, pp. 1–207, 1–409–420.

Chart 3–1

DISTRIBUTION OF POPULATION BY EDUCATIONAL ATTAINMENT, March 1968



Source: U.S. Bureau of the Census, *Current Population Reports, Series P–20, No. 182, Educational Attainment: March 1968,* USGPO, Washington, April 28, 1969, p. 9.

those aged 25 or more; 28.5 per cent for ages 25–29; 36.3 per cent for ages 20–24 (33.3 per cent for ages 22–24, 40.0 per cent for ages 20–21).[2] The last figure is presumably the one which is high partly because the survey excluded many servicemen not in college, and not just because the attainment rate in the whole population rose so rapidly.

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[2] Calculated from data in the source for Chart 3–1.

Educational attainment reflects other characteristics besides age, of course. It is well-known that children in a well-educated, high-income family are more likely to attend college than other children, with the father's own educational attainment having some effect independent of income.[3] Educational attainment also varies widely with the region of the country, with residence in metropolitan or nonmetropolitan areas, and the like. Information on these patterns can be found in the source for Chart 3–1. The role of race is shown on Chart 3–2, where the attainment of whites and nonwhites are shown for the same age group. The chart suggests that much of the difference in college attendance rate may be traced back to the lower high school completion rate for nonwhites. It would be most interesting to look at the record of nonwhites in a younger age group for very recent trends, but again the exclusion of single men living on military posts clouds the picture. The best one can say is that recently nonwhites seem to have stopped gaining on whites in the attainment of some college. The available data are presented in a footnote.[4]

There is also a pronounced difference by sex. Men have attained much more higher education than women. In March 1968, 11.6 per cent of the women aged 25–29 had graduated from college, as compared to 18.0 per cent of the men. However, a comparison of younger age groups with older ones shows that the attendance rate is rising faster for women than for men. It is also interesting that the percentage of nonwhites aged 20–24 who have completed at least one year of college is slightly higher for women than for men, although the reverse is true for older age groups.[5]

Educational attainment as measured in years does not reflect the distribution of educational capital valued by its cost, because the cost of higher education is greater than that of lower education. A distribution of attainment in years does not give the proper weight to the years beyond the high school level.

Both direct and indirect costs are higher for the later years of schooling. Teachers' salaries are higher, due to the greater opportunity earnings their own education can command. Libraries and research laboratory facilities are greater in scope. Within the college years, these costs continue to increase, because the later years of college are usually featured by lower faculty-student ratios and by more independent work requiring laboratory and library facilities. And graduate in-

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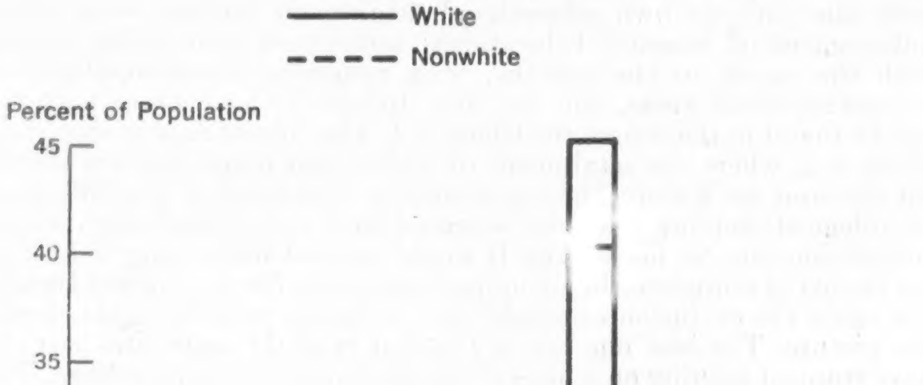
[3] See the discussion later in this chapter, and in Morgan, James, *et. al., Income and Welfare in the United States*, Survey Research Center, University of Michigan, McGraw Hill Book Co., New York, 1962, pp. 371–83.

[4] In March 1968, nonwhites aged 20–24, like their white counterparts, showed a large increase in the percentage completing at least one year of college, compared to the nonwhites aged 25–29 and compared to the nonwhites aged 20–24 the previous year. The 1968 percentages were: for 25 years or older, 11.0; ages 25–29, 17.2; ages 20–24, 22.4 (ages 22–24, 21.0, and ages 20–21, 24.2). The corresponding figures for whites were 21.2, 20.0, and 38.2, respectively (35.1 for ages 22–24, 42.2 for ages 20–21). These figures show that nonwhites gained somewhat on whites between the 25 and over and the 25–29 age groups, but not at all between the 25–29 and the 20–24 age groups. Either because of sampling variability or the Vietnam War, the survey for just one year earlier showed surprisingly different trends. It showed the gains for nonwhites between the 25–29 and the 20–24 cohorts as substantially *less* than for whites. For 1967 percentages of nonwhites completing one year of college or more were 17.4 and 18.0 for the 25–29 age group and the 20–24 age group, respectively; for whites, they were 30.4 and 35.4, respectively. Thus between the two age groups the attendance rate increased five percentage points for whites but less than one point for nonwhites. The data in this footnote are from the source for Chart 3–1, pp. 10–12, and from *Current Population Reports, Series P–20, No. 169, Educational Attainment: March 1967,* February 9, 1968, pp. 9–10.

[5] Data on differences by sex calculated from the source for Chart 3–1, pp. 9–12.

Chart 3–2

DISTRIBUTION OF POPULATION AGED 25–29 BY EDUCATIONAL ATTAINMENT, March 1968



Source: Same as for Chart 3–1, pp. 10–12.

struction is even more costly per student. Indirect costs also increase, because for each year of education attained the opportunity earnings one could make by working go up.

The distribution of education measured by its costs, then, will look somewhat different from the distribution of completed years of school. It will be more skewed to the right on a chart like 3–1, if the horizontal scale is measured in dollars instead of years. It would require extended research to estimate the full cost of each year, especially the capital costs (depreciation and implicit rate of return on capital). Allocating the costs of any institution—elementary school, high school, or college—to the first year, second year, and so forth would be quite arbitrary because of the great amount of common overhead expenses. Rather than attempt this, I have merely created two hypothetical sets of figures and traced out the implications of each on the distribution of educational capital in the population. These two sets of figures are described in Table 3–1, and the resulting distributions plotted in Chart 3–3. One set, identified by "Assumption A," is derived on the assumption that the opportunity costs of earnings rise quite sharply in the last years of high school, and direct costs rise sharply beginning with college. "Assumption B" describes the other set, based on an assumption that both direct and indirect costs rise more slowly. Assumption A's distribution, therefore, is skewed more to the right.

TABLE 3–1.—*Illustration of effects of increasing cost on the distribution of educational capital in the population aged 25–29, March 1968*

I. COST OF EACH YEAR

Year (grade)	Assumption A[1]			Assumption B[2]		
	Direct cost	Foregone earnings	Total	Direct cost	Foregone earnings	Total
1 to 8	$600	0	$600	$600	0	$600
9 to 10	600	0	600	600	0	600
11	600	$2,000	2,600	600	$1,000	1,600
12	600	2,300	2,900	600	1,100	1,700
13	2,000	2,645	4,645	1,500	1,210	2,710
14	2,200	3,042	5,242	1,575	1,331	2,906
15	2,420	3,498	5,918	1,654	1,464	3,118
16	2,662	4,023	6,685	1,737	1,610	3,347
17	2,928	4,626	7,554	1,824	1,771	3,595
18	3,221	5,320	8,541	1,915	1,948	3,863

II. CUMULATED COSTS OF CAPITAL

Year class	Assumed Average[3]	Cost of capital possessed		Percent completing, 1968[4]
		Assumption A	Assumption B	
Elementary:				
0 to 4	2.0	$1,200	$1,200	1.1
5	5.0	3,000	3,000	.5
6 to 7	6.5	3,900	3,900	2.9
8	8.0	4,800	4,800	4.8
High school:				
1	9.0	5,400	5,400	5.0
2	10.0	6,000	6,000	7.0
3	11.0	8,600	7,600	5.5
4	12.0	11,500	9,300	44.6
College:				
1	13.0	16,145	12,010	5.6
2	14.0	21,387	14,916	5.7
3	15.0	27,305	18,034	2.5
4	16.0	33,990	21,381	9.8
5 plus	17.5	45,815	26,903	4.9
Total				100.0

[1] Direct costs assumed to rise 10 percent annually after year 13, opportunity costs assumed to rise 15 percent annually after year 11.

[2] Direct costs assumed to rise 5 percent annually after year 13, opportunity costs assumed to rise 10 percent annually after year 11.

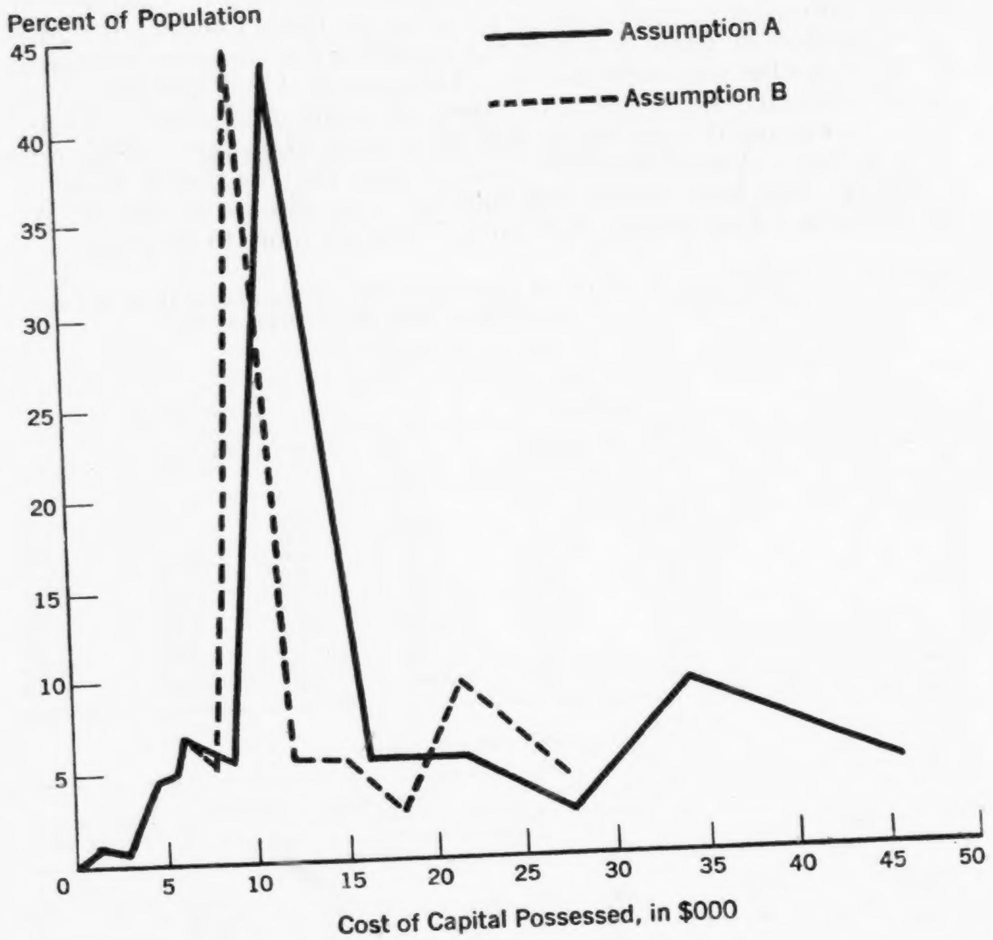
[3] Midpoint of the census year class.

[4] Percent of the population aged 25–29.

Source: Hypothetical data except for "Percent completing" which is from chart 3–1.

Chart 3–3

ILLUSTRATION OF EFFECT OF INCREASING COST ON THE DISTRIBUTION OF CAPITAL



Source: Table 3-1.

It hardly matters what precise pattern of increasing costs is assumed, since any increase for the advanced years will produce more skewness than shows up in the distribution of years of school completed. This general skewness is also exhibited by income distributions. The general shape of the distribution of capital is quite relevant, independent of the distribution's position on the horizontal scale. The distribution exhibits a particular form of inequality. It is a legitimate question to ask whether this skewness is desirable or unavoidable, and the question is relevant to public policy. It remains relevant in spite of the fact that in absolute terms the average [illegible]ational attainment of the American population is very high, th[illegible]s increased greatly, and that it continues to increase. The high levels of educational achievement are important facts, but many observers are still troubled at the sharp dropoff in the percentages attending college and completing college, compared to the percentage completing high school. It is interesting that in the population aged 25–29 the fraction of high school graduates who have completed college is substantially less than the fraction of college graduates who have gone on beyond college.

TABLE 3–2.—*Educational attainment of persons 25 years and older, 1910–1968*

Date	Percent completing high school (1)	Percent completing college (2)	Ratio (2)/(1)
1910	13.5	2.7	.20
1920	16.4	3.3	.20
1930	19.1	3.9	.20
1940	24.1	4.6	.19
1950	33.4	6.0	.18
1960	41.1	7.7	.19
1968	52.6	10.5	.20

Source: U.S. Office of Education, *Digest of Educational Statistics, 1968*, USGPO, Washington, 1968, p. 9, and U.S. Bureau of the Census, *Current Population Reports, series P–20, No. 182, Educational Attainment: March 1968*, USGPO, Washington, Apr. 28, 1969, p. 9.

TABLE 3–3.—*Percent of high school graduates who went on to college, by 1968 age group*

Age in 1968	Percent of high school graduates	
	At least 1 year of college	College graduate
20 to 24	47	(1)
25 to 29	39	20
30 to 34	38	21
35 to 44	37	21
45 to 54	35	17
55 to 64	42	21
65 to 74	42	20
75 or more	45	22

[1] 11, but not indicative of true trend because inadequate time for completion of plans.

Source: Calculated from data in U.S. Bureau of the Census, *Current Population Reports, series P–20, No. 182, Educational Attainment: March 1968*, USGPO, Washington, Apr. 28, 1969, p. 9.

The dropoff between the high school graduation rate and the college attendance rate is not much different now than it was many decades ago, although it is much less than in the more recent past. This is shown by the historical data in Table 3–2, which shows how the attainment of the population over 25 has changed in this century. The ratio of college graduates to high school graduates fell after 1930 and then rose again, but is now about what it was early in the century. Another way of looking at this is shown in Table 3–3, where the attainment of different age groups in 1968 is shown. It shows that the person who graduated from high school recently was not much more likely to finish a year or more of college than the high school graduate of several generations ago. The data there apply to people alive in 1968; since the mortality of college graduates appears to be slightly less than that of people who graduated only from high school, the figures for the older cohorts are biased a bit upward.[6] And the figures for even the 25–29 cohort probably lag the true trend in college graduation rates. But the figures clearly support the main point that this aspect of the shape of the distribution has not changed much in the very long run.

The Distribution of Educational Capital and American Values

What is a "good" distribution of educational capital, and how does the actual one stack up to acceptable criteria? Questions of distribution are normally ones of value judgment, rather than of positive economic principles, so that one must approach this problem in terms of the general American value system.

Perfect equality is not part of the value system, and it is not necessarily a bad feature of the distribution of educational capital that it does not show near perfect equality. Not everyone can profitably use the same education as others, either for his own benefit or for society's. For another thing, not even everybody who can afford to do so wants to make the heavy investment in education. This would be true for some even if all the benefits were capturable by the individual. Some people have a much greater preference for consumption now rather than in the future, which outweighs the future return an education brings. Others have unusually high opportnity costs at a young age, because they can already command high earnings (some athletes and entertainers are examples). These and other factors suggest that the unequal distribution of educational capital is not due only to the unequal distribution of income and of past educational attainment.

However, many argue that a widely accepted American value is violated by the present distribution, even though we have come a long way in extending educational attainment. "Equality of opportunity" sums up what I have in mind. This principle is that all should have an equal opportunity to exploit his native talents and to better the position of his father. It is opportunity which is to be equal, not achievement: we accept that, within limits, people's incomes vary due to native ability, the willingness to save, the willingness to work, and, for that matter, luck. Society attempts to put some floor under family incomes to prevent utter degradation, but it tolerates wide variation due to misfortune and actually encourages variation due to varying initiative and willingness to exploit opportunities. But equality of opportunity is an accepted goal.

In the light of this, the shape of the distribution has certainly attracted attention. In earlier times, many Americans regarded a college education as something special to be purchased by a relatively small part of the population. More recently, the steep decline between the percentage completing high school and the percentage having even as little as one year of college needs explanation. It needs all the more explanation because this particular aspect of the distribution has not been eliminated over several generations.

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[6] See preliminary research results reported in U.S. Bureau of the Census. *Current Population Reports, Series P-60, No. 56, Annual Mean Income, Lifetime Income, and Educational Attainment,* U.S. Government Printing Office, Washington, August 14, 1968, p. 21.

Is the distribution of ability responsible? Does the ability distribution drop off rather sharply to a rather low percentage of the population who can cope with college level material? If so, the number who can profitably use college education drops off sharply from the number who can benefit from high school completion, even if the difficulty of college is not much greater.

It is impossible to answer this question by reference to statistics on the distribution of ability. We do not know how ability is distributed, because there is no simple measure of ability. Ability is not like height, or weight, which can be measured on an equal-unit scale. There is no single test that satisfactorily measures ability; a test can be devised to give almost any distribution of scores one wants. The questions can be made up so as to produce a "normal" distribution, or they can be made up so as to produce a drastically skewed distribution. Psychologists and teachers aware of the problems of testing do not claim that any particular test accurately mirrors the distribution of intelligence. The purpose of testing is not to uncover the distribution for the whole population, but rather to compare one individual with another, i.e., to rank persons.

In fact, the fundamental tack in test design is to assume that ability is normally distributed, and then to design a test which produces a normal distribution of scores. Inferences about the population distribution are not made from the test results, rather inferences are made about the nature of the test from the fundamental assumption of normality. The widely used intelligence tests are explicitly designed to produce normal distributions. The test is judged by the assumption of normality; the notion of normality does not come from the test results themselves. For example, one expert writes:

> We know now that test scores can be manipulated to give us any sort of distribution that we want. Because there are definite mathematical advantages to be obtained from normal distributions, one of the aims of present-day test-builders is the construction of tests that will *give* normal distributions for the types of population in which they are to be used.
>
> Because of these facts about test scores and what we can do with them, it is impossible to determine whether or not most mental traits are actually distributed normally in the population as a great many physical characteristics seem to be.[7]

There is thus no way to know if the distribution of ability is so skewed as to justify the skewed distribution of educational attainment. Nor can we say the distribution of attainment is bad on grounds that the distribution of ability is normal. However, the writer just cited also writes:

> But there is a great deal of evidence that distributions of both physical and mental traits are *continuous*, and this finding is of

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[7] Tyler, Leona, *The Psychology of Human Differences*, D. Appleton-Century Company, New York, 1947, p. 29 (emphasis in original). A similar conclusion is reached by Anastasi and Foley: "Strictly speaking, it is impossible to determine the actual distribution of a variable unless an equal-unit scale of measurement is employed. * * * The only methods now available for obtaining equal units in a psychological test are, however, based upon the assumption that the behavior under consideration is itself normally distributed. Thus to ask what is the actual distribution of behavior constitutes, at least for the present, a meaningless question." Anastasi, Anne, and John Foley, Jr., *Differential Psychology*, Macmillan, New York, 1949, p. 88.

> the highest importance. What this means is that there are no separate classes, no types * * *. When sensitive measuring devices are developed to assess any trait, we find that the scores show a range from very little to very much of the trait in question, with no breaks in the distribution anywhere. We need to give some thought to this concept of continuous distribution because it involves a change in some of our most deeply ingrained habits of thinking about human beings. We have inherited a great number of classification systems which, from childhood on, we apply almost unconsciously. It is perhaps the major contribution that differential psychology has made so far to have demonstrated that all such systems, whether they divide people into the wicked and the righteous, the stupid and the intelligent, the beautiful and the ugly, or the neat and the slovenly, must necessarily falsify the facts.[8]

This point becomes relevant when one considers the great variety of "colleges," many offering places to students who are only as able, or less able, than the average high school graduate. These lower quality institutions are established in response to a desire to attend college plus the willingness and ability to pay the direct and indirect costs. If there were a greater effective demand for such schools, more would be established. The rapid growth of new colleges, public and private, in recent years suggests that the lack of qualified students is not the roadblock. Yet there remains the gap between the high school completion rate and the college attendance rate. Despite the enormous variety in type and quality of institutions, and despite the demonstrated possibility of establishing new ones to meet the needs of students with only average ability, we have the evidence from the data presented earlier that only 28.5 per cent of the population aged 25–29 in March 1968 had gone to college *as much as one year* (only about half of those graduated). Only 36.3 per cent of the 20–24 age group had gone at least one year. The figures for the nonwhite population are, of course, lower: 17.2 and 22.4 per cent, respectively.

The evidence, although indirect, thus seems to be that the distribution of ability does not explain the big drop after high school.[9] This naturally leads to an examination of the differences in cost between high school and post-high school, differences which are very great and which may well explain the shape of the distribution.

Cost as a Limiting Factor

A college education is a very expensive piece of capital to buy. Many families who could afford to buy it do not choose to pay the price, and its price is simply beyond the reach of many lower income families. I have already explained why it is not easy to solve the problem by borrowing. Here, the point to be made is that the private costs of college are much higher than of high school, and remain higher despite the public subsidies that are provided. This is one explanation for the low rate of college attendance compared to high school graduation.

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[8] Tyler, p. 30.

[9] See additional discussion in Wolfle, Dael, *America's Resources of Specialized Talent*, Harper & Brothers, New York, 1954, pp. 145–6.

The costs are high even for the education part of the college experience. It is true that some costly non-academic features have traditionally also been part of the experience for many families. Prominent examples are living away from home and well-organized athletic and social programs. College is not merely increased education in the intellectual sense, but a whole range of new experiences which contribute to the general development of the person: living away from home, athletics, social life. But the cost of these parts does not really explain what we are trying to explain. Families now have a choice of many different college packages, some of which do not include these added features, and which accordingly cost less. There are many community colleges to which students commute, for example. Whatever one thinks about the desirability of the shift to stripped-down packages, and the greater concentration on the academic part of the experience at the expense of some other parts, it is clear that the costs of the academic part alone are high enough to limit demand.

The full social costs of college are high enough, but the public financing of high school causes the increase in *private* costs to be even more abrupt. Secondary school education is provided free, as a public good, with the direct costs mostly defrayed by tax collections. The taxes are levied on property, sales, or the like, and what a family pays has no connection with whether or not its members go to school, or how long they go. From the family's point of view, there is really no direct cost at all for the instruction, since the taxes it pays will not vary with the amount of instruction. There are some costs for other things, for example, clothing and entertainment, which are hard to avoid. They are often significant burdens for poor families.[10] But they are small compared to the direct costs of college.

College education is much less free. Some tuition and required fees must usually be paid. These fees will be significant for poorer families, even at colleges where the quality of education is low and where there are few frills. Few persons receive relatively as much financial aid as the public high school automatically provides. If the student must leave home, room, board, and travel costs may also be higher.

Indirect cost also rises in the college years. The opportunity earnings of young people increase sharply just at the time the crucial decisions must be made on how much investment to make in education. Compulsory school attendance laws, child labor laws, and a general lack of employment opportunities keep foregone earnings costs low until the last two or three years of high school. Then they rise and become a large cost of continuing in school. They are surely one reason, among others, why the retention rate drops off somewhat even at the 10th or 11th grade, and then more after the 12th.

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[10] Some of these costs, of course, are like the college costs mentioned later, in that they are not strictly necessary for education narrowly defined. But in practice they are paid. Evidence that they can be burdens for high school students' families is cited in Weisbrod, Burton A., "Preventing High School Dropouts," in Dorfman, Robert, ed., *Measuring the Benefits of Government Investments,* The Brookings Institution, Washington, 1965, p. 132; and in Sexton, Patricia C., *Education and Income,* The Viking Press, New York, 1961, pp. 204–206.

One factor is the biological fact of the person's normal maturation, which produces physical strength. Another reason is the very success of high school in raising his earnings capability. High school graduates do earn more than dropouts. A graduate knows more or is presumed to know more. Employers may make graduation a requirement; even if they make mistakes screening labor this way, it is a cheap and acceptable device. The student recognizes that high school completion brings him higher earnings from work, and has an incentive to finish. But, *the very reasons for his sticking it out provide a strong reason for not going on to college.*

One must not underestimate the earnings which are foregone by remaining in high school the last year or two, or if high school is completed, by going on to college and not entering the labor force immediately. A 1966 Census Bureau income survey reports the mean earnings of men who were aged 14–19, and full-time year around workers, as $2,680.[11] Since a fair percentage of these full-time workers were actually less than 18 years old, and presumably earned less than older workers, the median for workers aged 18 and 19 was probably higher, and for those over 19 even higher.[12] And a man who had graduated from high school would earn more than the mean for all men aged 18 or 19.

Another indication of opportunity costs comes from a Census Bureau survey, done for the Department of Labor in February 1963, of a sample of youths aged 16–21 who were no longer in school and were not college graduates (member of armed forces were not included in the sample).[13] About 45 percent of the sample had dropped out before completing high school, 48 percent had finished high school, and 7 percent had completed 1–3 years of college. Of those who had full-time jobs in February 1963, 71 percent of the male high school graduates (including those who had some college) were earning $60 a week or more and only 6 percent were earning less than $40. Even 45 percent of the male high school dropouts were earning $60 or more per week and only 20 percent were earning less than $40. Among women, about two-thirds of the high school graduates were earning $50 or more, and nearly half the drop-outs; only 12 percent of the graduates and only about one-third of the drop-outs were earning less than $40.

Since the earnings at the time of the survey might not reflect the opportunity earnings as of the time decisions were made to leave or stay in school, results from this survey on earnings in the *first* full-time job are also of interest. The results apply to the first full-time jobs of those who were still working full-time in February 1963. The study reports the following approximate percentages of persons who earned $50 or more per week in the first full-time job: male high school drop-outs, 50 percent; male high school graduates, 70; female drop-outs, 20; female graduates, 55.

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[11] U.S. Bureau of the Census, *Current Population Reports*, Series P–60, No. 58, *Year-Around Workers With Low Earnings in 1966*, U.S. Government Printing Office, Washington, D.C., April 4, 1969, p. 17.

[12] In 1960 21.2 percent of those full-time workers aged 14–19 were less than 18 years old. U.S. Bureau of the Census, *U.S. Census of Population: 1960*, Vol. 1, *Characteristics of the Population*, Part 1, *United States Summary*, pp. 1–487.

[13] Perrella, Vera C., and Forrest A. Bogan, "Out-of-School Youth, February 1963," *Monthly Labor Review*, November 1964, pp. 1260–8. All the statistics in this and the next paragraph are from this source.

Statistics on earnings and unemployment are frequently cited as evidence of the poor economic situation of teenagers, especially high school drop-outs. And they do represent poor opportunities compared to those for older groups. But compared to not entering the labor force at all, the opportunities may appear not bad at all. Although the chances for getting a job are far from perfect, they are much higher than zero. Earnings from jobs are sizeable and they make a welcome addition to total family resources if the teenager's income is pooled with the rest of the family. They lift significant living costs from the rest of the family if he lives separately. If he comes from a family of limited means, the teenager undoubtedly realizes that by investing in college and foregoing full-time work, either he or his family (or both) must sacrifice valuable things—current consumption, or alternative investments like housing.

Finally, there are all the psychological costs of making abrupt changes in a young person's life pattern. If there is no college within commuting distance, he must leave his home area and strike out on his own. He may view this with much more trepidation than leaving home to get a job, for he may be able to settle near his home after beginning work. Even if college work is not much "harder" than the last year of high school, college is different in kind. The decision to continue high school involves no such problems; the last years are more difficult, but not much different in kind, and the student lives at home. The psychic costs of beginning college are likely to be greater for young people from poorer homes, in which the parents have little education and exposure to new ideas and new people has been limited.

THE ABILITY TO PAY FOR HIGHER EDUCATION

The high cost of college makes it not surprising that its purchase is highly correlated with family income. While this is more or less obvious to the casual observer, there are solid bits of empirical evidence on the question.

Perhaps the most important evidence is that gleaned from the Project TALENT survey sponsored by the U.S. Office of Education. It is a longitudinal survey of the high school classes of 1960 and 1961 and their experiences from 1960 to 1966. The students were classified by ability-achievement level, based on a battery of test scores and other factors, and by "socio-economic status" of their family, based on family income, father's educational attainment, and several other factors. Table 3–4 presents data on the effect of socio-economic status on the probability of the student entering college within one year after high school graduation and within five years. It is very clear that in a given ability-achievement group, attendance is positively related to socio-economic status. Interestingly enough, immediate attendance is also positively related to socio-economic status, as shown by the fact that the relative gap between the two percentages in each cell of table 3–4 declines as status rises. It must be stressed that the data apply only to high school graduates; high school completion itself is of course related to socio-economic status in much the same way.[14] However, the survey shows that for all persons entering college full time within one year, the probability of graduating after four years is not much correlated with socio-economic status. Within some ability-achievement groups, in fact, the probability of finishing is higher for some lower status groups than for higher ones. The data do clearly show a strong correlation of the completion rates than ability-achievement scores, however.[15]

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[14] U.S. Department of Health, Education, and Welfare. *Toward a Long-Range Plan for Federal Financial Support for Higher Education: A Report to the President,* January 1969 (mimeo), p. 55.

TABLE 3–4.—*Probability in percent of high school graduate entering college during the year following graduation, or the 5 years following*

Ability quintile	Socioeconomic status				All in ability group
	1 (high)	2	3	4 (low)	
Top 20 percent	95 (82)	79 (66)	67 (55)	50 (37)	79 (66)
2d 20 percent	84 (69)	63 (50)	52 (38)	36 (25)	60 (47)
3d 20 percent	69 (56)	46 (33)	34 (23)	24 (14)	41 (29)
4th 20 percent	56 (38)	34 (22)	27 (16)	17 (10)	28 (18)
Bottom 20 percent	40 (27)	28 (15)	19 (13)	15 (8)	20 (11)
All in socioeconomic status	79 (65)	53 (41)	39 (28)	23 (14)	54 (35)

Note: The figure not in parentheses is the percentage of all high school graduates who entered college within 5 years; the figure in parentheses is the percentage entering within 1 year.

Source: Robert Berls, U.S. Office of Education, unpublished paper based on Project TALENT data. (The top 2 rows of figures not in parentheses are also published in U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan for Federal Financial Support for Higher Education: A Report to the President*, January 1969 (mimeo), p. 6.)

A more recent report sheds light on another important dimension, the *quality* of college education a youngster is likely to get. This is the Census Bureau's very valuable report based on a survey of college students in October 1966.[16] In the survey, which covered about 35,000 households, information about family income was obtained from the families which had dependent members (mainly sons and daughters) enrolled in college, and also information about the college (some of this information was obtained independently). Such dependent family member college students were estimated to be 71 percent of all college students. I shall use the shorter term "college students" in referring to them.

The resulting estimates of family incomes of all college students are shown in column 1 of Table 3–5. They must be compared to the incomes of families in general. Column 2 shows the incomes of all families in the United States in 1966. If the two columns are compared, it is clear that there is a positive relationship between income and college attendance and that students tend to come from the upper part of the income scale. Families with incomes of $15,000 or more, for example, have double the representation in the student body than they have in the population, and the situation is exactly reversed for families receiving less than $5,000. Now, it is indeed useful to know that college students are likely to be from better-off families; it tells us something important about college students. But the comparison just made lets us conclude nothing at all about low income as a barrier to going to college, because the set of all families in column 2 include a lot which have no college-age children in the first place. The oldest and the youngest families are the least likely to have children of college age, but they also have lower incomes, and so bias the comparison. The 1966 income data are silent on the more narrowly defined set of families with college-age children, but they do show separately families classified by age of head, which should make the comparison much more meaningful if not exactly correct. The most relevant age groups would seem to be 35–44 and 45–54, so the incomes of these kinds of families are shown in columns 3 and 4 in Table 3–5. Those older families have a significantly more favorable income distribution than all families. The association between attending college and income shows up less clearly in this more meaningful comparison. Nevertheless, the great underrepresentation of the poorest families and the overrepresentation of the richest ones remain in evidence.

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[15] *Ibid.*, p. 60.

[16] U.S. Bureau of the Census, *Current Population Reports, Series P–20, No. 183, Characteristics of Students and Their Colleges, October 1966*, U.S. Government Printing Office, Washington, May 22, 1969.

TABLE 3–5.—*Income of families of college students compared to all families, 1966*

Family income	Percentage distributions			
	Students [1] (1)	All families [2] (2)	Families, head aged 35 to 44 (3)	Families, head aged 45 to 54 (4)
Under $3,000	4	14	7	9
$3,000 to $4,999	10	14	11	10
$5,000 to $7,499	21	22	22	20
$7,500 to $9,999	20	20	23	20
$10,000 to $14,999	28	20	27	27
$15,000 or more	18	9	11	15
Total	100	100	100	100

Note: Detail does not add exactly to 100 because of rounding.

[1] Estimated 3,849,000 students enrolled in October 1966 who were 14 to 34 years old and dependent family members, and for whom family income could be estimated on the basis of the census population survey. The survey could not estimate the family income of about 10 percent of the students surveyed.

[2] The original data on which cols. 2, 3, and 4 are based were for the income brackets $6,000 to $7,000, $7,000 to $8,000, etc. To achieve comparability with col. 1, the $7,000 to $8,000 bracket was split evenly between the $5,000 to $7,499 bracket and the $7,500 to $9,999 one.

Sources: U.S. Bureau of the Census, *Current Population Reports*, col. 1, *Series P–20, No. 183, Characteristics of Students and Their Colleges*, U.S. Government Printing Office, Washington, May 22, 1929, p. 2; cols. 2, 3, and 4, *Series P–6, No. 53, Income in 1966 of Families and Persons in the United States*, U.S. Government Printing Office, Washington, Dec. 28, 1967, p. 24.

However, it is not only the mere fact of attendance which matters but also the quality of the college. It is fortunate that the survey in question uncovered information about the colleges students were attending. College characteristics of some interest in this connection are described in Table 3–6. Each of the five sections of the table, A, B, C, D, E, classifies the colleges attended by students from the different income classes by certain characteristics. However, not all the characteristics described in the table have any clear connection with quality. Even the observers who would be willing to venture an opinion about whether large or small colleges, for example (see section C of the table), are better would disagree with one another. Section D, on tuition and fees, presents no clearer picture, because the charges to students may be more determined by whether the institution is public or private than by the costs of its instruction.

TABLE 3-6.—*Relationships between quality and other characteristics of colleges and the family income of students*[1]

Characteristic of college	Under $3,000[2]	$3,000 to $4,999	$5,000 to $7,499	$7,500 to $9,999	$10,000 to $14,999	$15,000 or more	Total
	Percent of income class						
A. Level:							
2-year college	24	25	22	23	16	17	19
4-year college	76	75	77	77	84	83	81
Undergraduate	(71)	(72)	(71)	(72)	(78)	(78)	(75)
In 5th year or higher	(5)	(4)	(6)	(5)	(6)	(4)	(6)
Total	100	100	100	100	100	100	100
B. Control:							
Public	57	69	60	66	56	46	58
Private	33	27	34	30	40	50	37
Not reported in survey	11	4	7	5	4	4	5
Total	100	100	100	100	100	100	100
C. Enrollment size:							
Under 2,500 or not reported in survey	48	36	30	21	27	30	29
2,500 to 9,999	29	41	31	36	33	24	31
10,000 or more	23	24	39	43	40	47	40
Total	100	100	100	100	100	100	100
D. Tuition and fees:							
Under $250	37	35	31	28	25	19	27
$250 to $499	23	37	30	38	31	27	31
$500 to $999	18	16	17	13	16	15	15
$1,000 or more	13	9	15	17	24	34	21
Not reported in survey	11	4	7	5	4	4	5
Total	100	100	100	100	100	100	100
E. Rank of college by index of freshmen aptitude:[3]							
Low	25	25	21	17	16	10	17
Medium	26	38	48	47	46	39	43
High	15	11	13	18	23	40	22
Not reported in survey	36	26	19	18	16	12	18
Total	100	100	100	100	100	100	100

[1] See note 1 to table 3-5.

[2] The percentages for this income class are based on relatively small numbers of students sampled and are thus subject to considerable sampling error.

[3] Index based on aptitude scores on reading comprehension, abstract reasoning, and mathematics tests of students surveyed in the Project TALENT study of high school seniors in the early 1960's. The scores of several successive high school graduating classes entering college were obtained and combined into composite scores. These scores were standardized to a distribution with a mean of 50 and a standard deviation of 10. Colleges whose students averaged 53 or more were classified "high," 47-52, "medium," and less than 47, "low." Generally, institutions with less than 10 freshmen in the Project TALENT survey were not ranked.

Source: U.S. Bureau of the Census, *Current Population Reports, series P-20, No. 183, Characteristics of Students and Their Colleges*, October 1966, U.S. Government Printing Office, May 22, 1969, *passim*.

Note: Detail will not add to 100 because of rounding.

Section A does show that higher income students are somewhat more likely, but not by a great margin, to be attending a four year college rather than a junior college. Section B shows differences between private and public schools. Here the data perhaps reveal the most by showing that while low income families are more likely to patronize public institutions, a great many high income people go to them too. Nearly half—46 per cent—of the students from $15,000 or more families were in public institutions. Most of them must have regarded it as somewhat of a bargain, considering the low tuition usually charged. Section D of the table, in fact, shows that the same fraction, 46 per cent, of the highest income students attend institutions which charge less than $500. These low-price schools are of course mainly public ones. So while many high income families do pay a high price and attend private institutions, a large fraction of them do not, but avail themselves of the large subsidies to education channeled through public institutions.

Sections B and D also show that many even rather poor students are able to attend private, high tuition colleges, by dint of either the sacrifices they and their families make or scholarships.

Section C shows a strong preference of wealthier families for large places. This says little about their taste for quality. But section E offers much more solid evidence on all this. As the footnote to the table describes, the classification of colleges by ability of the student body rests on procedures quite acceptable for this kind of global analysis. And the data show a very strong tendency for the better quality educations to be received by the higher income families.

Does It Matter?

The poor are poor. There are lots of things they don't buy much of, and higher education is only one of them. Does it matter that higher education is one of them? Is it special in some sense? Or should the failure of the poor to buy higher education be accepted as a natural consequence of the unequal distribution of income, and be given no more attention than their failure to buy expensive automobiles or clothing? If higher education should be generally subsidized on account of its external benefits, are there grounds for subsidizing it more for lower income people than for higher income people?

Not everyone would say yes. To many, the failure to attain an education is seen as essentially no different a failure by the poor than their failure to be rich. These people argue that higher education has already been made very cheap, that the poor do not have the background to profit from it, that attitudes are really responsible, that subsidizing a poor student takes away a place from a more intelligent lad whose family is willing to pay a larger part of its own way.

There are genuine issues, issues in interpretation of the facts and issues in value judgments. The arguments just made can be very convincing. They have some measure of truth. But on the whole they are somewhat misleading. Education is not very cheap when one considers the foregone earnings costs and the difficulties of borrowing to finance it, the plethora of low-tuition public institutions not to the contrary. And there is not a fixed number of "places" in the long run; if society desires to devote more resources to higher education and authorizes its governments to go into the market and bid for resources, or gives private institutions the wherewithal to bid for them, the number of places will increase. True enough, in the short run there might be a shortage of places for higher income students of only average ability if an immense amount of aid were given directly or indirectly to lower income students. But this would be a short-run problem and would exist only as long as it took to expand the whole educational system. The system can expand rapidly, that is clear. The contentions about inadequate background and attitudes are potent arguments, but can be answered by arguments that low income is clearly something of a barrier to attendance, that it is much more a barrier to attendance at high quality institutions, and finally that attitudes and motivations would surely change if financial barriers were lowered. The contentions do express the legitimate point that motivation for college is created in elementary and secondary education, the quality of which must be improved if more aid is to be effective in increasing attainment of higher education.

Those who champion concentration of increased aid on lower income students can make more positive arguments. One is that such concentration is necessary for the efficient allocation of society's resources. The native ability of young people is one resource available to us, and optimum use of it requires that more of other resources—teacher hours, classroom space—be applied to more able than to less able minds. If one accepts that intelligence is distributed normally, the evidence on income and college attendance clearly suggests that educational investment is not now being channeled wholly according to native ability. This leads many to say that at least there should not be outright discrimination in favor of investment in less talented people and against investment in more talented ones, just because the former happen to have been born into less well-off families, but that that is what happens if families are left to shoulder so large a part of the costs of higher education.

Presumably, few argue that the remedy is to expand opportunities for poor students completely at the expense of ones better off. Some argue strongly that the present system excessively subsidizes higher income families, because the low tuition in public institutions is available to students without consideration of whether they could pay their own way. But they would not go as far as to say that attendance by rich students should be restricted, and a fixed number of places reallocated more to able poor students. The tradition of inheritance is still strong in American society, and the inheritance of a good education is an especially strong part of it. Under this tradition, higher income families should be free to buy the quality eductaion they can afford for their children, even children of below average intelligence. The social good may even require that some subsidies be given them to overcome the bias due to externality of benefits; even if subsidies are not important in determining whether their children go to college or not, it may be necessary to offer incentives to buy more costly and higher quality education, which may turn out to have commensurately more external benefits. This question is discussed more in the next chapter. Certainly it would be repugnant to have the state allocate the places in higher eductaion solely on intellectual ability, without regard to ability to pay. But without going to that extreme one can still object to the present allocation of students to institutions as too heavily dependent on parents' ability to pay and not enough on the capacity of the child.

What is advocated is an asymmetry. Any family should have access to at least the kind and quality of education it is able and willing to pay for; the tradition of inheritance should be followed that far. However, not receiving an inheritance should not doom a youth whose family cannot pay for the quality of education appropriate to his ability. This is essentially an argument based on the value of equality of opportunity.

Others may favor heavy aid to higher education for the poor as one part of a more general policy to redistribute income. Aid to education is attractive to them because it offers hope of a lasting long-run redistribution accomplished in a way which is more appealing to many Americans than certain other measures. It may offer advantages over, and be politically more acceptable than, liberalization of welfare or a guaranteed annual income. Of course, by its nature it can work only for certain segments of the poor, so it must not be the only tool in redistribution. Also, it necessarily must work only rather slowly.

The strategy is, however, appealing because it has less of the "give-away" ring than other measures. The aid the recipient gets has an enormous value, but it also requires a great input of his own—his time and effort. It helps him create something of value out of his innate potential which is already there. And it is redistribution which is only temporarily at the expense of others, for it does more than support current consumption. This is because it raises the incomes and appreciation of education in people who are now poor and thus tends automatically to create the financial ability and motivation for them to bequeath education to later generations.

IV. GENERAL ISSUES IN PUBLIC AID

Aid to higher education can be given in a number of forms—scholarships, loans on favorable terms, guaranteed loans on commercial terms, grants to institutions, tax credits to parents, and many others. In Chapter V, I discuss a number of forms; and a major point there is that different forms can have very similar effects and thus are quite substitutable for each other. But there are some general issues which must be resolved no matter what specific form of aid is given, and the resolution of which will shape the details for any particular form. I discuss those issues in this chapter.

While some of the issues can be partially resolved by resort to economic analysis, many of them cannot, for their resolution depends on the basic goals and values of our society. A society worried about rapid growth in conventionally measured economic magnitudes, such as GNP, will resolve some of the issues differently than a society worried more about the quality of life and equality of distribution of income. While they are not necessary at every place in this chapter, at the outset I make the following assumptions about the values most people in this country seem to accept:

1. Higher education is good for society. While many persons invest heavily on their own, for a large number the private benefits alone are not sufficient to induce them to invest. The external benefits of their education are lost to society unless subsidies are offered. These subsidies are justified by the need to induce investment, not by any desire to reward people who would have been good enough to invest even without them.

2. Even with subsidies, investment in higher education is highly correlated with income, so educational capital is unequally distributed. Although a large degree of inequality in consumption of things in general is tolerated in American society, investment in education is

regarded as an exception, because the dependence on income violates equality of opportunity for young people who had no choice on whether or not to be born into lower income families. Aid to education should improve equality of opportunity; at the very least, it should not worsen the distribution of income.

I shall dicuss various issues one by one, although of course they are very much interrelated. The last one is how subsidies ought to vary with income, and is raised by the assumed desire for equality of opportunity. To avoid complicating the discussion of the other issues with reference to this all pervasive one, the reader is asked to assume that until the issue is raised explicitly all students who ultimately benefit from the subsidy are from the same income level.

How Big Are the External Benefits?

This question naturally cannot be answered completely with economic analysis, because even the external benefits which are narrowly economic, i.e., the favorable effects on economic growth, cannot be qualified. The noneconomic ones are even harder. The answer must come out of some social consensus. My only contribution here will be to mention a number of aspects of the issue.

It is fair to assume that the social evaluation of external benefits will vary with the kind of education, in terms of the content and the type of educational institution.[1] Training in classics may be seen as having more or less external benefits than training in nuclear physics; experience in the small all-men's liberal arts college more or less than experience in the large co-ed university. In American history, training in the mechanical arts and agriculture was long more heavily subsubsidized by government than the liberal arts. Even today, graduate training in the sciences is more subsidized than in the humanities. During most of the 20th century, the larger part of government subsidies have gone to large universities rather than the small liberal arts college.

Until relatively recently state governments presumably have felt the external benefits to their populations were large for education in one or two state universities or in a chain of small teachers' colleges, and much less worth concerning themselves about in any other institutions, which were usually granted only exemption from property tax. Such values have changed in the past and are likely to change in the future. Note how external benefits are different from private benefits in this matter. The state does not concern itself with evaluating private benefits for prospective students. The responsibility of gathering knowledge about potential income, the costs of various institutions, and details of programs, and the final choice of institution are left to the family. Consumer sovereignty—investor sovereignty, really—is the principle. But *external* benefits are public benefits, and governments must decide. It makes no sense at all blindly to assume they are simply proportional to private benefits. The success of an institution's program in providing private earning power in the market is no firm guide to its ability to provide education with public benefits. While some institutions are widely assumed to be quite good at producing both, they may be exceptions. By definition, external benefits are ones the market cannot value. There is no substitute for the political process in valuing them. This does not mean that the routine operation of colleges and universities need be dragged into politics, or that the legislature cannot regard a wide variety of institutions' programs as being equally productive.

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[1] Kaysen, Carl, "Some General Observations on the Pricing of Higher Education," *Review of Economics and Statistics* (Supplement: August 1960), pp. 55–60.

A particular question in valuing external benefits is quantity versus quality. Dollar for dollar, is it more valuable to educate a few to a higher level or many to a lower level? Are the external benefits of 1,000 students being educated at a college which spends $2,000 per student greater or less than 500 students at one which spends $4,000 per student? Are they greater if 1,000 students go two years to an institution or if 500 students go four? Do the costs incurred by the institution really have anything to do with the quality of education, in terms of external benefits, in the first place? The answers are one factor determining whether the rate of subsidy is constant for all levels of expenditure by a family, or whether it declines at the margin as total expenditure rises.

AID TO INSTITUTIONS OR TO STUDENTS?

This is one of the oldest issues. Under aid to institutions I include State operation of a public college or university which charges tuition far below its cost of operation. The persons who argue in favor of institutional aid seem to feel that only in this way will a subsidy produce increased quality of education, which they feel is desirable. They apparently assume the natural inclination of institutions which find themselves with more funds is to increase quality rather than to lower tuition. In a moment I shall comment on this assumption. Those who argue in favor of aid to students feel that it maximizes the scope of choice open to families and subjects institutions to healthy competition.

However, if the alternatives are aid to a wide variety of institutions and aid to students which can be used by them in a wide variety of institutions, there may be little difference in the result. Consider the situation where colleges compete vigorously for students, a fair description of the private college sector in the United States. A wide variety of institutions offer a wide variety of educations. Some feature high-cost, high quality (high faculty-student ratio, good laboratories and libraries) packages, some low-cost, low quality packages. The packages differ greatly in other dimensions as well (specialization in programs and majors, composition of student body, location), which are neither here nor there as far as quality is concerned. Each institution appeals to a somewhat distinct clientele in the population. Now assume public aid is offered to all institutions, say in the form of a flat sum per student. Each institution can choose to use the funds to raise the quality of its package, or to use them to hold quality constant and lower the tuition it charges, or some combination of the two. It must decide what kind of clientele to appeal to. What it does will depend on who is on its board of trustees, on whether there are pressures by the faculty for better students, on the kind of clientele it has appealed to in the past, and a host of other things. Not every institution will choose the same strategy. A wide variety of results will occur, and families will have considerable choice. Some will be happy to get higher quality and pay the same price as before, others will prefer to buy the same quality as before for the lower price.

What would have happened if aid had been offered to the students, say in the form of a scholarship usable at any institution? Every family would then have the choice between using the scholarship to reduce the expenditure out of its own pocket and still buy the same education as before, and using it to add to its own expenditures so it can improve quality. Some will prefer to do one, some the other, and many some of both. Colleges and university trustees know this, and so they have a choice too. It is the *same choice* as in the previous case. They can hold the line on quality and price or they can raise both quality and tuition. Many different combinations are viable as long as there is diversity in the population. We would expect the same diversity of results to occur as under institutional aid, therefore. A family desiring higher quality education will likely find it under either kind of aid, and so will a family desiring a lower price.

This leads to the conclusion that if most institutions would choose to upgrade quality, as the proponents of institutional aid assume they would, it would be because *most families are happy with that outcome and would choose higher quality if aid were given directly to them.* In a system where there is competition for students, this is the only explanation why most institutions would feel they can get away with raising quality.

From the point of view of government, the results are quite satisfactory if it believes that external benefits are roughly proportional to the cost of education, i.e., that quality counts. If it does not believe this, then it better spend its money if it makes sure the final result is a lower price for the same quality education as before. But if the appropriate strings are tied to the aid, again it would not seem to make much difference whether it was given to students or to institutions.

This has ignored administrative costs. They are probably much lower if aid is given to institutions, and this is an argument in favor of aid to institutions, as long as the aid is given to a wide variety of institutions. If government gives aid to only one or to a few, as state governments often do, it is no longer true that the two kinds of aid produce the same results. State governments have always given the overwhelming bulk of their aid in the form of operating low-tuition state colleges and universities. Even in states where there are a good number of such colleges and university branches, a student's choice is obviously much more limited than if he had received a scholarship he could use at any institution, public or private, in the state or out. The institutions receiving the aid still have the options described earlier, but now their freedom is limited only by the elasticity of demand of the whole market facing them, not by the price and quality competition of other institutions. The elasticity of demand for the whole market is much lower than for the product of one institution competing against many others. It would be much easier in the situation for the few aided institutions to impose a higher level of quality on the market than the market would choose in a more competitive situation. A rise in quality might then not be due to overwhelming demand for it, but rather to the tastes and energy of the trustees. But of course the quality standards imposed on the population may turn out to be *lower* than the population would choose if there were competition in the offering of subsidized education: Low quality level cannot be attributed automatically to overwhelming demand in this case either; again, it may rather be explained by the tastes or energy of the trustees.

If the issue of student aid or institutional aid is raised in the context of *Federal* policy, there would seem to be no danger that institutional aid would be limited to so few institutions as to allow to persist a quality standard greatly at variance with popular desires. The danger would probably be greater in the context of *state* policy, and those who argue strongly for aid to students may see the only alternative as aid to only a few institutions. They see the dangers of limiting aid to a few institutions as greater than the opportunities such concentration may have, such as economies of scale or the creation of special kinds of social benefits valuable to the state.

Federal Government and State Governments: How Big a Role for Each?

A correct allocation of resources to higher education in a country requires not merely public subsidy, but also the proper division of subsidy by level of government. In a federal system, the society cannot rely on each state government, acting independently, to finance benefits which accrue externally to their own states. State A's sizeable expenditure on higher education may reflect public opinion that there are large benefits external to individuals but internal to the State A. But State A cannot be expected to count as public benefits the education provided for residents who later leave the state, or the benefits to the rest of the nation from a better educated population living and working in A.[2]

In addition to the usual kinds of external benefits related to a "better society" broadly defined and to rapid economic growth, there are some fiscal effects. If education raises a person's income it will almost certainly increase the amount of state tax revenue collected. This source of tax revenue is lost to the state if the person moves away. Such losses may be much emphasized in popular discussion. However, higher income people may also use more public services and so add to the state's expenditure as well. If the person leaves, both tax revenue and expenditures fall, and there is a loss to the state only if the net change is unfavorable.[3] If the net change is unfavorable, the state has captured less of the external benefits its educational efforts were designed to capture. The state to which the person moves may receive the benefits from the first state's efforts, including all the "better society" benefits, plus a fiscal benefit if the new resident's tax payments exceed the extra cost of providing him public services.

While the state authorities cannot predict exactly whether an educated person will leave the state, they may generally discount the benefits of higher education because of migration. Weisbrod notes the complaints of public officials about the migration losses of educated people; he quotes one public statement from a state college: "We invest thousands of dollars in rearing and educating growing people—only to find them migrating to other areas."[4] Although such discounting may not be explicit, we may presume it happens. The higher tuition charges to nonresidents at state universities clearly indicates states know the difference between internal and external benefits. The strong academic specialties of some state universities, obviously related to their own states' economies, are additional evidence. Jencks has said, "Only a few public institutions have sought and obtained national constituencies, and none encourage this at the undergraduate level."[5] This and common sense suggest strongly that a state will leave to someone else education which does not benefit its own population.

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[2] See the general discussion by Burton Weisbrod in *External Benefits of Higher Education*, Princeton University, 1964, *passim*. Considerable stress is put on benefits external to a state in Hansen, W. Lee and Weisbrod, Burton, *Benefits and Costs of Public Higher Education in California*, a report to the Joint Committee on Higher Education of the California Legislature, Madison, Wisconsin, 1967 (mimeo).

[3] Weisbrod, and Hansen and Weisbrod stress the importance of this net change in discussing the effects of migration on the ability of states to capture the social benefits created by their expenditure. Weisbrod, *External Benefits*, pp. 69–94; Hansen and Weisbrod, *Benefits and Costs*, pp. I–10, II–6.

The hypothesis that a state will spend less on higher education when a large part of the total benefits are external has not been adequately tested in econometric analysis. However, Weisbrod tested it for expenditure on elementary and secondary education. He found a statistically significant negative correlation between current education expenditures per student by a state in 1961 and the net out-migration of population from the state during the 1950's, even after holding constant several other important variables which influence expenditure: income, federal aid, state aid to local school districts, prevalence of private schools, racial composition, and division of enrollment between elementary and secondary. Weisbrod found that for states having had net out-migration, on the average a one point increase in the percentage out-migrating was associated with a $4.04 decrease in expenditures per student. On the other hand, in states having had net in-migration, the rate of net in-migration and expenditures were not significantly correlated positively or negatively. This suggests that net out-migration depresses expenditure, but net in-migration does not raise it. The effects of migration do not cancel out: states losing population this way reduce quality of education because some benefits are external, while states gaining population do not raise their quality.[6]

While this test is only for elementary and secondary education the effect may be even stronger for higher education, because the probability of migration increases as educational attainment increases.[7] And a state may be even less confident that expenditure on higher education will have the offsetting effect of attracting new residents that expenditure on primary and secondary education, because where people live is not as crucial for the kind of higher education their children get as it is for the lower education.[8]

As a general principle, the fraction of the total public subsidy defrayed by a political jurisdiction should be the share of benefits external to the population of the jurisdiction. A local government should offer high subsidies if a large proportion of benefits are external to the individual but internal to the locality; a state's payment should depend on the benefits external to the locality but internal to the state.

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[4] Weisbrod, *External Benefits*, p. 102.

[5] Jencks, Christopher, "Diversity in Higher Education," in U.S. Office of Education, *Contemporary Issues in American Education,* Bulletin 1966, No. 3, USGPO, Washington, 1965, p. 61.

[6] Weisbrod, *External Benefits*, pp. 6–7, 100–116.

[7] *Ibid.*, p. 48.

[8] As independent observers of California, Hansen and Weisbrod conclude that it is very doubtful that California's high expenditure on higher education has really had much favorable effect on the location of new residents and firms in the state as a whole. Hansen and Weisbrod, *Benefits and Costs*, pp. 11–27e–27g.

The Federal Government should assume responsibility for the rest. Theoretically, the scheme is simple, but in practice it is impossible to implement precisely. External benefit depends on whether people migrate after gaining education, so the appropriate shares are not known at the time education is financed. If migration were the only cause of external benefits, a possible arrangement would be to have the state where the student lives pay the whole subsidy, but be eligible for a refund from the Federal government on any resident who moves away. In practice, some other rougher allocation procedure, based on recent migration trends, would have to be used.

Of course migration is not the only cause of external benefits, so other things must be taken into account in determining the precise shares of each government level. However, the migration effect does mean that state financing of higher education has more external benefits for some states than others, which implies that the Federal share should not be uniform for all states. Federal aid should vary with the home state of the student ultimately subsidized. This kind of discrimination would cause political problems, of course. However, it is consistent with the logic of using a subsidy to correct for external benefits.

ONE DONOR AMONG MANY DONORS

The higher education community relies on some sources of financing which are public-spirited but private: alumni, wealthy individuals, corporations, and foundations give subsidies of their own to colleges and to students. Government must decide what its own strategy should be in the light of these philanthropic subsidies. Should public aid be given without regard to how well the recipient does in getting the philanthropic subsidies? Or should government take them into account, cutting back its aid to students and institutions who are getting a good deal from the others? Or, should it actually promise more to those who win support from elsewhere, as an incentive to work hard to win it? In addition to this question for the public sector, there is a similar question for a particular government—state or Federal—of how it should react to aid by other governments, as well as aid by private donors.

Perhaps the most difficult problem raised by the multiplicity of donors is that some give so unevenly, favoring some places and not others. Alumni and state and local governments are both examples. Should the Federal government give less to a Harvard or a Rochester because of its enormous endowment? Should it give a smaller scholarship to a poor student at a low tuition state university, relying on the state to continue its own contribution?

This is a separate problem from the one which always faces the Federal government in designing any scheme for grants-in-aid. When external benefits are involved it is natural for the donor to condition a grant on some contribution by the recipient—some local effort. Such a condition attached to Federal grants for higher education, either to students, or to colleges, or to states, would be natural because there are both private and public benefits, and because there are both localized and national public benefits. But even if the donor is committed to pay only a fraction of certain costs, the question is whether the fraction should vary according to the extent *other donors* supply funds.

It is interesting that some philanthropic donors frequently use the incentive feature. The best known example of this is the foundation "challenge grant," but individual donors may use it as well. Some Federal aid programs, but not all, are on a matching basis, and the institution is perfectly free to raise its own share from other donors.

If government gives on the incentive basis, there is the problem that some of the subsidy may ultimately benefit students who are already heavily subsidized by other sources. This may be hard to justify. The fact that the other donors are private and do not raise their money by taxes will not necessarily blunt criticism. People may see little difference, in fact, between public sales taxes to raise money for educational subsidies and the use of part of what customers pay for a firm's products for donations, either directly by the firm or indirectly because a foundation owns the firm's stock. On the other hand, if government tries to even out the distribution by granting aid inversely to what comes from elsewhere, it runs the risk of the other sources cutting back their own aid in the belief that government will make it up. If a Federal scholarship program, for example, made the stipends a fixed fraction of tuition, many public institutions might be tempted to raise the proportion of their costs defrayed by tuition, hoping that any adverse effects on lower income students would be prevented by increased Federal expenditure.

Not everyone would say that is a bad thing. Besides the widespread unhappiness with the income distribution impact of the public system, there is uneasiness about the so-called crisis in private education. For the Federal government the crisis makes this whole question tricky. Private institutions, especially some small liberal arts colleges and some particular universities, have found it difficult to compete in the face of the enormous price advantage state schools offer. Some have been absorbed into state systems. In a federal system states rightly have considerable autonomy to support goods and services their governments think are socially worth while. The state governments have chosen to subsidize education in a particular way. Even if many people think this is regrettable, the Federal government may want to accept the situation, making no effort to restore balance between public and private institutions, or among institutions of various sizes and characteristics. This hands-off policy would be consistent with confidence in consumer sovereignty and reliance on the market to reward the truly high quality, innovative private institutions. On the other hand, there is the fear that unless the Federal government deliberately offsets the uneveness of public subsidy private education will fall too far by the wayside, with the loss of the diversity so valued in American higher education. That is a result the *nation* may not want to let come out of the interaction of the states' policies and the market.

How Should Aid Vary With Income?

This issue is interrelated with the others, for several reasons. One reason is that the public donor can itself determine the income distribution effect of its actions if it gives aid directly to students. If it gives aid to institutions, on the other hand, it loses this control. This is so unless it can control the institutions' pricing policies, which determine how the subsidy is transferred to students. Another possibility is if institutions have very homogeneous student bodies, so that in choosing to help a particular one the donor automatically limits its aid to a narrow class of students. But there are obvious difficulties in trying to tie such strings to aid as to specify tuition structure, and heterogeneous student bodies are socially desirable and increase the external benefits of education. Neither can the donor be absolutely confident that the institutions will voluntarily arrange their tuition structures in the right direction. The private sector is in general more likely to do this, because private institutions charge all the students the same nominal tuition but offer aid to certain students, perhaps the very able ones, or the very poor ones, or both. But student aid is not so plentiful to go very far in that direction even in the private sector, and it is even less important a factor in the public sector.[9]

Another reason why the income issue is intertwined with other issues is that higher income families may not need public aid as an inducement to buy a college education, but the price may make more difference for the quality of the education they are willing to pay for. If this is true, then the issue of whether increased quality gives as much in external benefits, per dollar of cost, as the quantity of education is important. This is so because opinions on that issue determine whether people judge that helping the rich pay for higher education has sufficient external benefits to offset any undesirable effect on equity.

Some may feel that subsidies need not vary inversely with family income of the student. What is more relevant, it is argued, is the future income of the student himself. If aid allows a student to buy a lot of education, it will likely pay off in higher income later. We have made it possible to take the position that as a general rule *any subsidies* will tend to go to the rich! One implication of this would be that government should make mighty efforts to make loan funds available to students, but the students should be expected to repay the money, with interest. This would mean no subsidy. The only reason for subsidy would be to correct for external benefits; no additional subsidy is necessary for income distribution reasons. Moreover, if one doesn't believe there are important external benefits, there is no case for subsidies at all. Consider the following statement of this view:

> It is eminently desirable that every youngster, regardless of his parents' income, social position, residence, or race, have the opportunity to get higher schooling—*provided he is willing to pay for it either currently or out of the higher income the schooling will enable him to earn.* There is a strong case for providing loan funds sufficient to assure opportunity to all. * * * There is no case for subsidizing those who get higher education at the expense of those who do not.
>
> The great problem with higher schooling today is not that we are spending too little, but that we are spending too much * * *. Our state colleges and universities are burdened with youngsters who value the schooling they are getting at what they have to pay for it—namely, zero. * * *
>
> The way to broaden educational opportunity, raise the quality of college schooling, and simultaneously lower governmental ex-

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[9] See the statement by David Truman cited in the next chapter, suggesting that many "private" colleges are in a sense more public in how well they represent society than their "public" counterparts (note 27).

penditure is to exploit the insight that people value what they pay for and will pay for what they value.[10]

It is perhaps useful to suggest a plausible proposal which a person might support if he disagrees with such arguments, yet feels the distributions from the public purse should both vary inversely with family income and give adequate incentives for quality education. This proposal attempts to avoid windfalls for better-off families and yet preserve some incentives for them to demand quality. Let there be direct aid to a student as long as his or her family's expenditure exceeds some minimum level. This minimum level would be greater for higher income families, making them pay more out of their own pockets, than poor ones. But then make the aid a larger and larger fraction of marginal expenditure as total expenditure rises. The student from an upper-middle income family, merely to give an illustrative example, might receive no aid if he spends only $1,000 in tuition and fees, $100 if he spends $1,500; $250 if he spends $2,000; $450 if he spends $2,500; etc. The subsidy rate is thus 20 per cent on the first $500 above the minimum, 30 per cent on the next $500, 40 per cent on the next $500. This concentrates public assistance at the margin, where it is likely to make a difference. For a poor family, the minimum level might be zero, and the marginal subsidy percentages larger.

V. PARTICULAR PUBLIC PROGRAMS

In this section I shall describe some of the more technical features of the various forms in which the public sector can give aid to higher education. Some of them are possible ways of granting subsidies; others are ways of improving the operation of capital markets for the private financing of education. The forms included are: public scholarships, favorable loans to students (guaranteed loans, subsidized loans) contingent repayment plans (or "Educational Opportunity Banks"), income tax relief, work-study, grants and favorable loans for buildings and equipment, and more general grants to institutions, including the operation of low-tuition schools by the government itself. I have ignored, however, another kind of assistance which might have been included. That is the encouragement by government to individuals to donate money and property to colleges and universities by allowing them tax deductions for such gifts.

Currently, State and local governments give the bulk of their aid in one form, general-purpose grants to institutions. The Federal government uses a much greater variety of forms. No effort is made here to give an account of the history or details of the major Federal programs. But some of them are mentioned briefly as examples in the various sections of the chapter. For that reason, Table 5-1 presents a condensed version of a tabulation of Federal aid programs in fiscal year 1968 presented in a recent Department of Health, Education, and Welfare report to the President.[1] It should be realized that what expenditures should be called aid to higher education is not always clear and that the tabulation is just one version.

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[10] Milton Friedman, "The Higher Schooling in America," contribution to symposium on "Financing Higher Education," *The Public Interest*, Spring 1968, pp. 109–112. Emphasis in original. Friedman favors a contingent repayment loan plan, as explained in the next chapter.

[1] U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan for Federal Financial Support for Higher Education*, (mimeo), 1969, pp. 48–53.

TABLE 5-1.—*Federal obligations for aid to higher education, 1968 (estimated)*

Program	*Millions*
Total	$5,870
Research and development	2,147
Universities	1,449
University-managed centers	698
Facilities and equipment	986
Higher Education Facilities Act:	
Grants	307
Loans	159
Miscellaneous	10
Library resources	29
Health education and research facilities (Public Health Service)	174
Research facilities and equipment (National Science Foundation)	19
College housing loans (Department of Housing and Urban Development)	250
Other	39
Institutional grants	286
Developing institutions	30
Land grant colleges	15
Health training (Public Health Service)	79
Institutional development grants (National Science Foundation)	85
Computer activities support grants (National Science Foundation)	23
Other	55
Training grants	393
Institutes for teachers	40
National Institutes of Health grants	238
Institutes and conferences (National Science Foundation)	38
Other	77
Fellowships and traineeships	320
National Defense Education Act graduate	87
Teacher fellowships	28
Public Health Service	89
National Science Foundation	60
Other	56
Undergraduate student support	494
Educational opportunity grants	133
Insured loans[1]	38
National Defense Education Act loans[1]	184
Work-study	134
Other	5
Other student support	982
Veterans allowances	412
Social security benefits to students	432
Employee training in educational institutions	96
Other	42
Federal schools and academies	158
Agriculture extension	81
Other	22

[1] Small fractions were for graduate students.

Source: U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan for Federal Financial Support for Higher Education* (mimeo), 1969, pp. 48–53.

Public Scholarships

By a public scholarship I mean a government grant of money to a student, conditional only on his using it to attend some approved college or university, or a student grant from a college financed by a government grant made to the college conditional only on the grant being used to increase student aid.

A scholarship has the advantage of being easily understood by the recipient, and of thus making him fully aware of opportunities. It is more easily understood, for example, than a subsidized loan of comparable value. It can be easily tailored to meet the requirements of the general strategy of public aid. If it is a general policy to aid poorer students more, the scholarships can be awarded accordingly. If it is to emphasize quality by offering aid to gifted students from even high income families, the scheme can be adapted to this goal as well. This is true even if money is given indirectly through colleges, although of course steps must be taken to make sure the institution extends aid in the desired way.

If the funds are channeled through institutions, a student applies for a scholarship when he applies for admission. If income is relevant under the plan, he attaches a statement of family income, perhaps a copy of a tax return, to his application for admission. The college evaluates the student's non-income characteristics just as it does now, setting intellectual and other standards for its student body. It awards public scholarships to applicants according to criteria laid down by the government, and an applicant learns of his award when he opens his acceptance letter. He knows his prospective financial situation fully before having to commit himself to a college. If he receives a grant and accepts admission, the institution claims the amount from the government and credits his account. The reports and claims of both student and college are naturally subject to government audit.

If the government makes awards directly to students, the administrative costs are presumably higher because the public authority must deal independently with each applicant, rather than having much of the paperwork be a normal part of the college admission process (however, even under the other scheme, colleges have a larger work load processing applications, and should be compensated by the government for extra costs). A student applies directly to the public authority, submitting the same information as in the other case. It would be good if the government announces awards well before he has to decide where to go to college, since the point of the award is to widen the scope of his choice. After the student tells the authority where he intends to go, it gives the money to the institution in question.

By putting suitable strings on institutions, government can insure that the ultimate holders of scholarships are the kinds of students it wants to support, even if it does not select them itself. However, the choice of one administrative arrangement or the other will be more crucial for how those students are distributed among colleges. I rule out the possibility of giving direct aid but specifying where students must use it. Under a system of direct aid, therefore, the market in education is quite free and the scholarship holders may be quite selective: some institutions or even broad classes of institutions may wind up with very few scholarship holders. If funds are given to institutions, on the other hand, the original distribution of the money is a major determinant of the distribution of students. It is not the only one of course: an unattractive college will still not get very good students if it must compete with better places who also have public funds to hand out. But it is a major determinant.

Under institutional grants, then, government can step into the market and shape the fortunes of different kinds of institutions. No matter whether the aided students are poor or intellectually gifted, or both, many places are eager to get them to upgrade or to diversify themselves, so the dispensers of grants have enough carrots to dangle to give them significant say about the nature of education. Therein, of course, lie both the advantages and disadvantages of this method.

Scholarships may be accompanied by additional "cost of education" grants to the institution; in addition to the student grant, the institution receives an additional sum to use as it sees fit. These supplemental allowances are usually justified on the grounds that the student grant depends on tuition, which may be far below the school's marginal cost of educating a scholarship student. The institution receives such a supplement only if it latches on to a scholarship holder, which offers additional incentives to compete effectively in the market. For that reason, they are free of some of the shortcomings of other grants to institutions, shortcomings which I examine in a later section.

The amounts in Table 5–1 show that the Federal Government has some very large scholarship-type programs. Some of the large ones are for graduate education, especially in the sciences and in the health professions, and some are for upgrading the education of experienced teachers. In fact, the amount of money available for *undergraduates* would be rather small were it not for two big programs, veterans' educational allowances and the social security benefits paid to dependents after they reach age 18 only if they go to college. The latter does qualify as an education program because of the incentives and financial support it offers. As the table shows, these two programs totaled $800 million in fiscal year 1968. And, of course, they have been major sources of student support for many years in the past.

The only other major Federal undergraduate scholarships are the Educational Opportunity Grants, which totaled $133 million in 1968. The planned level of funding for fiscal year 1970 is $330 million. These grants were set up by the Higher Education Act of 1965. They are limited to low income students, and are granted by institutions out of funds given them by the government. At a recent date, about 290,000 students were receiving them in over 1,800 institutions.[2] The maximum amount is rather low, only $1,000, and it is clear from the figures that the average grant actually made has been much smaller. However, it must be remembered that a student may receive an Educational Opportunity Grant *and* other kinds of assistance, including the institution's own scholarship or loan, but also including other Federal money under programs described in later sections—National Defense Student Loans, work-study, and perhaps a loan from a commercial lender which has been subsidized by the Federal government. Recent estimates are that a total of one and one-quarter million students are receiving some aid from these four Federal programs, or one out of four undergraduates.[3]

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[2] *Ibid.*, p. 8.

The recent HEW report to the President recommended expanding the Educational Opportunity Grant program to provide an award to every needy full-time student, plus a cost-of-education allowance to the institution enrolling him. Total costs to the Federal government were estimated at $2.7 billion in fiscal year 1972, and at $3.1 billion in fiscal year 1976, assuming an increase in the maximum individual grant is needed by then. The student grant would initially be equal to national average college attendance cost (tuition, fees, room and board) minus an established sum representing an expected family contribution (which decreases as the number of children in the family increases), minus expected savings from summer employment, and minus 10 per cent of effective family income (income minus Federal income taxes and minus unusual special expenses). However, an upper limit of $1,500 is proposed for the start. Illustrative calculations in the report showed an only child would be entitled to $1,280 if his family's effective income was $4,000, while he would get no grant if the income was over $6,500. One of a family of four children could get $1,500 as long as family income were $4,000 or less, and his grant would not disappear until income exceeded $8,700. The cost of education allowance to the college would be $100 per student plus 25 per cent of each student grant in excess of $200.[4]

It should be noted that while the existing EOG's are available only to students defined as needy, the other Federal scholarships are not limited to poor students at all. The access to veterans benefits and social security benefits could not of course be tied to income because of the philosophy behind them, and both inevitably give large amounts of money to people who could afford to pay more for their own education. The veterans program, however, seems to have as an additional explicit goal the added compensation of men for the low pay and hardships they suffered while in the military, and so it would not be fair to criticize it on that score. The fellowships for graduate education are given to students with no very close attention to family income; ability seems to be the major criterion used by the universities and agencies awarding them. But here again the programs could perhaps be defended because the full costs of graduate education are so very large that even a family with quite a large income would find them staggering, while the costs are worth it to the society as a whole because of the external benefits from the advancement of knowledge and research.

Favorable Loans to Students

By favorable loans I mean loans made at lower rates of interest than students would be charged in the free capital market, or with longer repayment periods, or with the start of repayment delayed. I discussed earlier how the special character of human capital makes lenders reluctant to loan except on unfavorable terms, unless government subsidies and/or guarantees are provided. I shall not go over those special features again here. It should be noted that risk is not the only reason for high interest rates, however; the investigation, bookkeeping, and collection costs are high relative to the small amounts loaned, which means their contribution to the percentage rate of interest is high. The life of an education is long, but if the repayment period of the loan is also long, there are many repayments and thus higher costs. But I argued that in view of the unusual risks of financing education, some public insurance scheme is desirable to cover costs which remain for families to pay even after subsidies. And it is a real issue just how far to go in reducing the risk which rests on families, an issue the resolution of which will govern the limits on sizes of loans.

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[3] *Ibid.*

[4] *Ibid.*, pp. 32–3.

A loan can be guaranteed without being subsidized, and a subsidized loan might be only partially guaranteed. A guaranteed loan is one on which a government agency promises to make good any default if the loan was made at a specified interest rate, e.g., below some maximum rate. The lender receives no government payment if the borrower fulfills his commitment. A subsidized loan is one on which the lender's rate of return is higher than the rate he charges to the borrower, the difference being made up by government payments. These payments from government are made for every loan, whether there is any default or not. If the government also makes good a borrower's default on his own obligations, the subsidized loan is also a fully guaranteed one.

If a private borrower is willing to lend at some rate of interest, which is the total he gets from the borrower and from the government, the subsidy is defined in terms of the part paid by the government. There is a complication if government itself makes loans, at low rates of interest. This is because there is no commonly accepted standard rate for government loans which would represent "no subsidy." The problem of determining a standard, and thus determining the degree of subsidy on direct government loans, is the same problem as determining the appropriate discount rate for public investment. Economists are generally agreed that the correct rate is above the current government bond rate, and certainly may be different from the average coupon rate on all outstanding government debt. The government bond rate is felt to understate the true opportunity cost of the capital which government lending causes to be diverted into educational loans. This point should be remembered also when low-interest loans to institutions are discussed later in this chapter.

GUARANTEES ONLY

Even guarantees alone improve the ability of families to invest in higher education. The guarantees should have the most effect on loans to poorer families, for they are the ones least likely to have collateral to justify a low rate, most likely to overestimate risk and to be inhibited by a high rate, and the ones most likely to lack the funds to pay off high interest loans in short periods. However, in practice the maximum amount of the loan in guarantee schemes is not high enough to reduce all financial risk, and of course no guarantee can eliminate the risk of embarrassment at being unable to repay. Guarantees thus cannot approach the scholarship in reducing risk, but have a higher reduction of risk per dollar of long-run government expenditure because they are not needed for many rather confident students. Guarantees have their most potent effect on low income students who are financially unable to meet repayments on commercial loans, but are quite confident they can complete an education and use it profitably. For them, the guarantee eliminates the only real barrier, which is the risk their lenders feel. There undoubtedly remain a significant number, however, who are frightened by the need to repay and for whom more must be done to provide sufficient assurance to attempt a college of the quality their ability permits. Scholarships or some kind of contingent repayment plan, as discussed later in the chapter, may be necessary. This in spite of the recent changes in attitudes on the suitability of borrowing to finance higher education.

Some years ago there was a survey of students who had borrowed from NDEA loan funds. They were by definition fairly needy, but also by definition had borrowed some money. When asked how much *total debt* they thought they could incur for their education, 5 per cent said no more than $500, 18 per cent between $500 and $1,000, 29 per cent between $1,000 and $2,000, 24 per cent between $2,000 and $3,000, and only 23 per cent more than $3,000.[5] These figures certainly betray a inhibition about borrowing which is a significant barrier to investment in very high quality college education.

A major criticism of the existing loan guarantee programs is that the maximum amounts which can be borrowed are too low, and the repayment periods too short, to be very effective.[6] For undergraduates, a limit of $1,000–1,500 per year is common, and repayment must be completed by ten years after academic work is finished. A recent report, making calculations similar to the ones I make in the next section on subsidized loans, points out that "to lower repayments for a $10,000 loan to less than 10 percent of income in the years following college, when incomes may be in the $7,500 range, requires that loans extend for at least 30 years. Under present loan terms of 10 years, *even a zero percent interest rate* will not achieve this standard."[7]

A second major criticism is that there is some tendency in loan guarantee systems to keep the maximum guaranteed interest rate rigid in the face of changing conditions in the money markets. This has happened in the Federal loan insurance schemes for both education and for housing. If the purpose of the plan is only to reduce risk and not extend a subsidy, the guaranteed rate should rise as money markets tighten. The purpose of guarantees is to offset the unusual risk of educational loans, to reduce the differential between rates on education loans and rates on other long-term loans. Keeping the guaranteed rate rigid even when other interest rates are rising makes it very difficult for students to compete with other borrowers, because lenders prefer the higher rates available on other assets nearly as safe. If the rise in rates is due to a monetary policy effort to dampen investment, one particular kind of investment, education, winds up bearing more than its share of the countercyclical restraint. And there is reason to believe that investment by poorer families is the most likely to fall by the wayside when banks and other lenders curtail their loans: the few loans they do make are to established customers or other higher income people whose future business will be substantial, and with whom it is important to keep up banking contacts.[8]

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[5] U.S. Office of Education, *Student Borrowers, Their Needs and Resources,* by Robert Hall and Stanton Craigie, U.S. Government Printing Office, 1962. The survey was of 86,000 students who had borrowed in 1960.

[6] See, for example, the report, *Educational Opportunity Bank,* discussed below.

[7] U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan,* p. 72. Emphasis added.

SUBSIDIZED LOANS

I shall follow the definition of the previous section, and call a loan subsidized only if the borrower pays a rate less than the rate received by the lender. If a guaranteed loan is subsidized, the subsidy is represented by the difference between the guarantee rate and the actual rate to the borrower. The reader is reminded that others may prefer to use the term "subsidy" to cover even the reduction in the rate which a guarantee alone would accomplish; on that definition, the element of subsidy is considerably larger than on my definition.

To be mathematically more precise, the following definition is suggested: a. Ascertain the series of repayments which a borrower must make. For example, he can repay a 10-year loan of $1,000 at 3 per cent by making annual payments each equal to 10 per cent of the principal plus 3 per cent of the outstanding balance, $130, 127, 124, . . ., 106, 103. Or, he can make 10 annual payments each of the same amount, $117.23. There are, of course, other repayment arrangements which are regarded as paying 3 per cent interest. b. Using the rate of interest which the borrower would have to pay in the absence of any subsidy, discount the stream of payments to present value. The present value of the loan repayments may be called the "loan cost." c. Subtract the loan cost from the principal; the difference is the amount of subsidy.

For example, if we discount the repayment series $130, 127, 121, . . ., 106, 103, at 6 per cent, the loan cost is $868. Since the principal is $1,000, the subsidy is 13.2 per cent. If the repayment series of 10 payments of $117.23 is used, the present value is slightly different, $863 (that is, the two repayment series both have a present value of $1,000 at a discount rate of 3 per cent, but slightly different present values at a discount rate of 6 per cent). The subsidy is thus 13.7 per cent. This shows that the precise time pattern of repayments make some difference.

There are two main ways to arrange the loan repayment so that a subsidy is given. One is to make the borrower pay smaller amounts than he would have to pay otherwise; the second is to make him begin repayments only after some delay, rather than right after the loan is made. In both cases, the lender must receive an additional amount from the government. Either one of the arrangements will reduce the loan cost below the principal, and the two may be used together. However, if the loan is of limited term, the subsidy which can be given by a reduction in the stated rate alone is limited, unless the rate actually becomes negative. Even reducing the rate to zero has a limited effect.

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[8] See the discussion of the widespread requirement by lenders of "past customer relationships," in J. Philip Hinson, "Student Loan Programs for Higher Education," in *New England Business Review* (Federal Reserve Bank of Boston), Pt. 1, June 1968, and Pt. 2, July 1968. Hinson (p. 8) quotes a College Entrance Examination Board study showing that only 32 percent of the loans guaranteed by the Federal Government (see description of program below) have gone to students from families with gross income less than $6,000, while 17 percent have gone to families with income above $12,000. These are percentages of borrowers, not of dollars loaned.

For example, if the stated rate is zero, but the principal is repaid in equal annual installments beginning immediately, the percentage subsidies for loans of various terms, assuming the alternative rate of interest is 8 per cent, are as follows: 1 year, 7.4 per cent; 2 years, 10.8 per cent; 5 years, 20.1 per cent; 10 years, 32.9 per cent; 20 years, 50.9 per cent 50 years, 75.5 per cent.

Thus, unless the loan is perpetual, a reduction by a certain fraction in the stated interest rate will not reduce the loan cost by the same fraction, but by less. Halving the rate means the subsidy is somewhat less than 50 per cent of the principal. Assume again that the stated rate is 4 per cent, and the alternative 8 per cent. If the loan is to be repaid in equal annual installments, this halving of the interest rate reduces the present value of loan repayments by the percentages in column A below. If the alternative rate is 6 per cent, but the borrower pays only 3 per cent, the subsidy percentages are as in column B:

Term	A	B
1 year	3.7	2.
2 years	5.1	4.2
5 years	10.3	8.0
10 years	17.3	13.7
20 years	27.7	22.9
50 years	43.0	38.7

Delaying the beginning of repayments also provides a real subsidy, even if the stated rate of interest is no lower than the alternative rate the borrower would have to pay. The borrower gets a subsidy because he uses the funds interest free during the time which elapses before the repayments begin. If the alternative rate is 8 per cent and the borrower pays 8 per cent, but beginning 2 years later instead of one year, the loan cost is reduced by 7.4 per cent; if payments begin only 3 years later, it falls by another 7.4 per cent or a total of 14.3 per cent; if they don't begin until 5 years after the advance is made, the loan cost is 26.5 per cent below the principal.

For an example of using a lower rate and delay simultaneously, assume a 10-year loan of $1,000 where the rate for the borrower in the unsubsidized market would be 5 per cent. Two repayment schemes which would give no subsidy, because the loan cost is $1,000 in each, are:

(*a*) Ten equal installments of principal beginning one year after, plus interest at 5 per cent on the outstanding balance: $150, 145, 140, . . ., 110, 105.

(*b*) Ten annual installments of $129.50. If a subsidy of $100, or 10 per cent, is desired, any of the following schemes will do, because the loan cost is $900 in every one:

(*c*) Ten equal installments on principal, plus 2.8 per cent on the outstanding balance: $128, 125.20, 122.40, . . ., 105.60, 102.80.

(*d*) Ten equal installments of $116.55 (each installment 10 per cent less than in repayment series b).

(*e*) Repayment series a, but the first payment not due until about 38 months after the loan date, instead of 12 months.

(*f*) Repayment series b, but first payment not due until about 38 months after the loan date.

(*g*) Ten equal installments, plus *8* per cent on the outstanding balance ($180, 172, 164, 156, . . ., 116, 108), but the first payment not due until about 79 months after the loan date.

Example (*g*) shows that a longer delay period can more than offset a higher stated rate of interest. An infinite number of other combinations of delay period and stated rates of interest can produce a subsidy of $100, but they would involve differing collection costs.

The public sector can subsidize loans in the same discriminating ways it can give scholarships. It can vary repayment terms according to family income, ability, or any other criterion. And the loans can be made directly to students, or funds can be granted to institutions on the condition they be loaned to students, just as scholarships can be given directly to students or indirectly through institutions. Standard terms can be set up which imply a certain percentage subsidy, and then the maximum amount which may be borrowed under the program be made to vary with other criteria, such as the costs at the institution the student attends.

Proper administration of any loan program for higher education, subsidized or not, is costly. This is because equity demands that some effort be made to collect the amounts coming due. The costs of keeping a continuous record on a student for years after graduation, and collecting small periodic payments from him, have proved to be quite high under the NDEA loan program. A recent report says, "The delinquency rate exceeds 10 per cent on the NDSLP [National Defense Student Loan Program] primarily because of the mobility of former students."[9] And some years ago a study by the National Association of College and University Business Officers of a sample of representative institutions found median costs of over ten dollars per one-year loan for processing the application and paying out the principal, and median costs of about nine dollars per year later in collecting repayments. The study noted that the costs would total $113 if a student borrowed $500 in each of two different years, compared to interest collected of just $165; if he borrowed $500 in each of four years, they would be $135 and the interest $330.[10] These do not include any default losses.

High collection costs are not really much of a point against subsidized loans and in favor of scholarships, as long as we are talking about an equal amount of subsidy. The costs are costs of any loan financing of college education, and must be incurred whether the loans are subsidized or not, and whether they are made by private lending institutions, colleges, or a public agency. Only if one of those groups has a substantial advantage in administrative efficiency does the identity of the lender matter. Perhaps borrowers would be more careful to repay, and to notify of changes of address, a bank or other financial institution than they are the colleges who lend under the NDEA program. The costs would be even lower if families borrow from themselves—if one member borrows from another or if the family borrows from its present consumption—so that formal repayment schemes and records are not needed. But if families cannot do this, and public subsidies are only partial, recourse to loans is required anyway, so the collection costs will be a problem.

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[9] U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan*, p. 10.

[10] U.S. Congress, House Education and Labor Committee, 89th Cong., 1st sess., hearings, *Higher Education Act of 1965*, USGPO, 1965, pp. 427–8.

Therefore, if the only purpose of loans was to grant subsidies, there would be no point to using them instead of scholarships of equivalent value. But, of course, guaranteed lending is designed to ease the financing of private costs, and is justified even if subsidies are not. Since the administrative costs of lending and collection must be borne in a guarantee scheme anyway, it may be administratively efficient to grant whatever subsidies are desired by arranging loan terms. If both subsidies and guarantees are needed, a subsidized loan system may require lower administrative costs than if loans are only guaranteed and subsidies are extended in another separate program. Students applying for guaranteed loans can apply at the same time for a subsidized loan if their circumstances warrant it.

The Federal program of paying part of the interest on the commercial loans it guaranteed thus had considerable merit. However, it is difficult to give student aid only in this way. Not all families wish or need to borrow money, so a separate scheme to subsidize them might be needed anyway. This would happen if it is public policy to offer subsidies to able, high-income students. On the other hand, all families buying higher education at all must go through the college admission process, and most must file tax returns. It may be just as efficient to administer subsidies through the colleges or internal revenue service, and simply guarantee loans on commercial terms without subsidizing them. A "strictly business" practice for loans might also improve repayment by removing any sense that the loans do not really have to be repaid because they are from colleges out of government funds.

Another shortcoming of loan subsidies is that some families may not fully understand how valuable they are. An outright scholarship of $500, or announcement of a tutition decrease of $500, would make a much greater impact than offering a loan which has a subsidy component of $500, since appreciation of the magnitude of the latter requires some familiarity with discounting and present value concepts.

FEDERAL LOAN PROGRAMS

There are two major Federal loan programs. One is the National Defense Student Loan Program which was initiated in the National Defense Education Act in 1958. Under it large grants are made each year to institutions to be added to the capital of loan funds they operate. Students can borrow up to $1,000 per year from those loan funds. The participating institutions are supposed to meet the demands only of needy students. Although they have discretion in interpreting this, the evidence is that the loans have gone largely to low income students. A College Entrance Examination Board study showed that about half of the borrowers in 1967 had gross family income of $6,000 or less. It is estimated that in this program over 400,000 students, including only a few graduate students, received loans averaging $600 in fiscal year 1969.[11]

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[11] U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan*, p. 8, for 1969 figures; Hinson, "Student Loan Programs," Pt. 1, p. 8, for information on family income of borrowers.

The recipient institutions must match the Federal grants with one-ninth contributions of their own to their loan funds. Since the 90 per cent Federal contributions are grants and don't have to be repaid, the student loans in a sense are 90 per cent guaranteed, because only 10 per cent of what the institution risks in lending was originally its own funds. The loans are also subsidized, because they are made at 3 per cent for 10 years, and the repayment period is delayed (with no interest accruing) until about a year after the borrower ceases to be a student at any level of education. Calculations on the principles suggested earlier in this section, using an alternative rate of interest of 6 per cent, indicate the subsidy element is thus about 30 per cent on loans taken out for the freshman year, assuming repayment begins 5 years after the loan is made. Of this subsidy, the lower interest rate accounts for nearly half, the delay of the repayment period the rest. Loans for the sophomore and later years carry a smaller subsidy, since their repayment period is delayed less. The subsidy element falls to about 18 per cent for senior year loans. But if the student goes on to graduate school, the subsidy increases because the repayment is delayed more than these calculations assume.

Finally, there is an exception which increases the standard subsidy enormously for a large fraction of the borrowers. Part of the loan is forgiven outright if the borrower becomes a teacher (public or private, elementary, secondary, or higher education). For each year of teaching, 10 per cent of the principal (and interest on it) is cancelled, up to one-half the total (teachers in school districts which have a high concentration of low-income families can have 15 per cent of the loan cancelled for each year, and up to 100 per cent of the loan). For young persons who know they will, or even think they may, go into teaching after college, this is an important incentive to go to college in the first place, although the limits on the amount that can be borrowed are significant.

The American Council on Education recently stated that the NDEA loan program "* * * continues to be the strongest element in the ability of most institutions to meet the financial requirements of their applicants." However, there is considerable sentiment in favor of eliminating or restricting the teacher forgiveness provision. The Council said it favors eliminating it, with the money used instead for educational opportunity games.[12]

The outright grants to institutions in this program are of course a drain on the Federal budget. To save budgetary expenditures but still expand loan funds for students, the Federal government began in 1965 to support a variety of state and private nonprofit loan insurance plans around the nation which guaranteed loans made by regular commercial lenders. Some of the plans had been active for long before this; some were to be newly established. The theory was that even very small Federal contributions to the reserves of insurance plans could allow a great expansion in the volume of insured loans. The Higher Education Act of 1965, which initiated this effort, also permitted Federal payments to reserves of state agencies which loaned directly to students, and it established a Federal insurance fund to insure commercial loans in areas where state or private insurance was not available. In addition, the government offered lenders a subsidy on the guaranteed loans (up to $1,000 or $1,500 a year) which were made to students whose net taxable family incomes were below $15,000. To qualify, the loans had to be made at no more than 6 per cent interest, later raised to 7 per cent, and had to meet other criteria, including a repayment period delayed at least until after the borrower ended his studies. The loans had to be repayable over a 5–10 period, but had to be completely repaid by 15 years after they were given, no matter the repayment period delay allowed. The Federal government paid all the interest on the loan until the repayment period started, and then paid 3 per cent interest to the lender until liquidation. These payments were made directly to the lender. The teaching cancellation feature of the NDEA loans was not included. Colleges themselves may now lend their own funds and qualify as insured lenders under the guarantee program. Whether they take advantage of this will be interesting, in view of their record as conservative investors of their endowments.

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[12] American Council on Education, *Higher Education and National Affairs*, February 28, 1969, p. 2.

Amendments in 1968 eliminated the subsidy during the repayment period, leaving it in effect during the period the borrower is in college. The guarantee part of the program has been hampered by the fact that the general level of interest rates in the economy began to rise just as the program was getting started, and since the guaranteed rate was not raised in step with them, many lenders became unwilling to participate very fully. Nevertheless, it was estimated in January 1969 that in fiscal year 1969, over $600 million in new loans would be made to over 700,000 students.[13] In late summer 1969, with the start of classes a few weeks away, the maximum guaranteed rate of interest was still only 7 percent, compared to a prime rate of 8½ percent. Officials resorted to attempting to persuade the banking community it should make loans anyway, on the presumption Congress would eventually provide, retroactively, some "incentive payment" or other effective increase in the rate which lenders received.

CONTINGENT REPAYMENT PLANS

A significant variation on the guaranteed loan system has recently attracted great attention. In this variation, called contingent repayment, a student borrows money but does not agree to repay the full amount at some fixed rate of interest. Instead, he signs a contract to repay a certain *percentage of his income* in the future. This means a borrower who is relatively "unsuccessful" later in life pays back less than one who earns a higher income. If his income is notably low, he may wind up paying even less than he borrowed, with no "interest" at all. From a borrower's point of view, such an arrangement reduces the risk of earning too little to meet his obligation comfortably (it even reduces the risk of embarrassment). If he is very successful, he will have to pay back more than the average, but a man who is quite uncertain about his income prospects (including being uncertain about being able to finish college) may consider this a fair price to pay in exchange for being relieved of the risk of default or the risk of very burdensome obligations. For a lender, higher-than-average "dividends" from some borrowers will offset lower-than-average "dividends" from others, leaving a satisfactory return on the whole operation.

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[13] U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan,* p. 8.

While contingent repayment is a much older idea, it came into prominence again in 1967 when it was recommended by a special "Panel on Educational Innovation," working under the auspices of the President's Science Advisory Committee.[14] The panel recommended an Educational Opportunity Bank, which would make loans on a contingent repayment basis. The panel was made up of six educators and an official of the Office of Science and Technology as executive secretary, and was chaired by Prof. Jerrold Zacharias, a MIT physicist.

To quote the panel's report:

> The Panel recommends establishment of a bank, which might be called the Educational Opportunity Bank (Ed Op Bank), as an agency of the Federal Government. In order to obtain funds, the bank should be authorized to borrow money at going Government rates. It should be authorized to lend money to postsecondary students, regardless of the student's resources. A student should be able to borrow enough money to cover his tuition, costs, and subsistence at whatever college, university, or other postsecondary institution he is admitted to. The Bank would recoup these loans through annual payments collected in conjunction with the borrower's future income tax. At the time a loan was granted, the borrower would pledge a percentage of his future income for a fixed number of years after graduation. The Panel recommends that the number of years for repayment be 30, or perhaps 40, years. This period would be a fixed term for all borrowers. The percentage of income pledged would be proportional to the amount borrowed. Preliminary estimates are that the Bank could be self-sustaining if it charged borrowers 1% of gross income over 30 years for each $3,000 borrowed.[15]

The report also notes that "this might not be considered a 'loan program' at all, but a device for enabling students to sell participation shares in their future incomes." (page 1). The panel sees a contingent repayment scheme as having advantages over present loan programs:

1. No borrower need restrict his investment in education out of worry about a large debt he could not repay. This should make students much more willing to borrow than currently. Income barriers to attendance at colleges suitable to students' abilities would be drastically reduced, and students would have a much wider choice than under some other alternative kinds of aid to education.

2. By letting repayment be made over 30 or 40 years instead of 10, as is typical under present programs, students can borrow much larger sums than are currently allowed.

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[14] Panel on Educational Innovation, *Educational Opportunity Bank*, USGPO, 1967. Some of the previous proposals for a contingent repayment plan are found in William Vickrey, "A Proposal for Student Loans," in U.S. Office of Education, *The Economics of Higher Education*, edited by Selma Mushkin, Bulletin 1962, No. 5, USGPO, 1962, 268–80, and, in less detail, in Milton Friedman, "The Role of Government in Education," in Robert Solo, ed., *Economics and the Public Interest*, Rutgers University Press, New Brunswick, 1955, pp. 135–44. Since the Panel report, there has been a thorough analysis of many intricacies of the plan in Karl Shell *et al.* "The Educational Opportunity Bank." *National Tax Journal*, March 1968.

[15] Panel on Educational Innovation, *Educational Opportunity Bank*, p. 1.

3. The availability of loans is not directly affected by the state of the money market.

While the Panel recommends that the Bank be an agency of the Federal Government, it recognizes that this is not necessary. The novelty of the plan relates to the way in which loans are made, not in the precise institutional arrangements. A completely private bank could be created, raising capital in the regular money markets on the security of the dividend repayment contracts it makes with borrowers. In fact, it is an interesting question why no existing financial institution, or a new one created independent of government, has already done this on a large scale, either as a profit-making or nonprofit enterprise. Such a bank might be established by a group of cooperating colleges and universtities, contributing part of their existing loan funds and also investing some of their own endowment funds in its bonds.

Similarly, the scheme could be integrated into a public subsidy scheme for higher education, or be operated separately. Government might offer to pay part of a student's obligation to the bank. It might do this generally for all borrowers or discriminately according to some criteria. Or a government might itself lend money to the bank at low rates of interest, permitting the bank to break even at a lower expected return. The essential point is in the fact that the obligation to repay is expressed not as a fixed sum, but as some percentage of income.[16]

Advocates of an educational opportunity bank argue that it will especially help poorer students who have lower expectations on their future income and are more cautious about shouldering large fixed debts repayable in a short period. The plan thus would increase college attendance by lower income students and also expand their choice, by restricting them less to inexpensive commuter colleges or colleges near home. However, the panel notes that with expanded financial resources at the disposal of their customers, commuter colleges may be able to raise tuition enough to finance the quality which will make them more suitable places anyway.

Some other advantages cited are the usual ones of wide-based support, and do not depend on favorable effects on poorer students. The panel sees the plan increasing the viability of private institutions, who would also be able the raise tuition and tap the resources made available to students. And the plan makes young people more responsible for their own education, they having borrowed against their own future income rather than having relied on the largess of parents, legislators, and alumni.

Nothing being perfect, there are some distinct problems. Many of the students attracted to the plan will be those who have strong reason to believe they will not earn a high income. If the plan becomes loaded with such "poor risks," the result is an adverse selection which forces the borrowers who are successful to pay a higher percentage of income if the plan is to break even. And a very confident borrower will definitely not be attracted to the plan because a fixed loan will be more advantageous, especially if he realizes adverse selection is happening. This will make the selection all the more adverse. This may be avoided by setting certain standards for admission to the plan, standards which eliminate persons who it can be predicted will pull average incomes down. The plan is thus left only for people whose income prospects are truly uncertain, the people the plan is really designed for, after all. A fairly elaborate scheme, akin to that used in insurance, could set up a number of pools, poor risks being assigned to one, average risks to another, good risks to another, etc. All advance information available would be used to rate borrowers as much as possible, then all similar borrowers would be put together into a pool within which the remaining uncertainty cancels out. Since the average income in the high risk pool will be lower, the dividend rate as a fraction of income must be higher. Unfortunately, it is hard to see how all this rating will not work to the disadvantage of the lower income student whose true ability is often understated by his "record."

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[16] It is interesting to note Vickrey's suggestions. He proposed that borrowers contract to repay back into the fund more than required to cover administrative costs and amortize the fund's bonds, with the excess amount being loaned out to later generations of student borrowers. The fund would thus rely somewhat on internal financing and not completely on the bond market. However, the original borrowers' share of the excess amount would not be withheld forever, but returned to them as retirement annuities. The whole scheme was thus for a corporation whose business it is to loan-finance higher education for today's generation of students, but whose creditors include both outside bondholders and people who borrowed in previous generations to finance their own education. Vickrey, "A Proposal for Student Loans."

Incidentally, advance rating can partly be accomplished in the college admission process. High quality colleges, where people need large loans to go, have an incentive to screen applicants and grant admission only to ones with low risks, even if they do not operate the bank themselves.

Of course, rating and assignment to different pools can be accomplished in a guaranteed loan scheme as well. A contingent repayment plan may turn out to be very much like a guaranteed loan plan except that: (1) losses on unsuccessful borrowers are made up by successful borrowers, not the public taxpayer; (2) the plan, in the way it states the obligation to repay, lifts the risk of embarrassment from the borrower, which the guaranteed loan can never do. These are important differences, but it is not clear on which side they weigh.

Many (including the panel) have suggested that a participant should be able to buy up his contract at any time by paying some special charge. The charge would be large enough to deter participants who discovered they were moderately successful, but would make it attractive for extremely successful ones to escape the continual obligation to pay a fixed percentage of a very high income. That would reduce the tendency to adverse selection, but it makes the whole thing more like a fixed-loan operation.

Adverse selection becomes clearer if one sees why many women and low-income professional people will be eager to sign up. A woman who does not expect to earn much after marriage, or a teacher or minister who goes in mostly for psychic income, can avoid repaying very much. The contingent repayment plan could never manage to collect a share of psychic income. These men and women will wind up in loan pools along with other borrowers, because they can't be identified in advance, so the dividend rate paid by the others must be higher. There may be pretty strong objections to this. Why should men pay higher dividends to recoup the money loaned to women? It wouldn't be so bad if all the men in the pool were sure to marry women also in it, but that is too much to expect. So why penalize men who choose not to marry women who borrowed from the bank, or no women at all?

Likewise, it seems dubious to make borrowers who choose high-income occupations pay for the education of ministers. Many suggest this is really quite all right—some see it as an advantage of the whole scheme that it encourages people to enter the low-paying professions. But if ministers and teachers accept a low salary because their other rewards make up for it, they need no further compensation. One cannot meet this objection with the claim that the occupations in question generate unusually large external benefits, because even so their education should be subsidized by all the taxpayers, not just the people who happened to borrow money at the same time as they did.

The most likely future effort to improve loan financing will probably be one making longer-term money available at fixed interest, but without "mutualization" to the extent implied in the opportunity bank plan. The authors of the recent H.E.W. report to the President proposed a National Student Loan Bank which would make student loans for up to 30 years.[17] The Federal government would guarantee the loans and pay the interest during the period of enrollment. Except for this, most borrowers would repay the loans at a fixed rate of interest. The rate charged would be determined by the Bank's own cost of borrowing. Students could borrow amounts up to cost of tuition and fees and subsistence minus other Federal assistance they received. The repayments would be collected by the Internal Revenue Service as the Bank's agent. The one concession in the plan toward favoring borrowers who earn little is a "low earnings cancellation provision." The Federal government would pay the Bank enough each year to allow it to cancel that year's obligations of a borrower whose income fell below some level or whose repayment exceeded some percentage of his income. But the Bank would be allowed to cancel no more than 10 per cent of the scheduled repayments in any year, and it would have to do it equitably by limiting cancellations to those with "the lowest earnings in each age, sex, and family size category" (p. 70). The cancellations would thus depend on decisions made each year and a borrower could not count on getting one even if he forecast his income accurately.

INCOME TAX RELIEF FOR STUDENTS AND FAMILIES

In recent years many legislators and others have advocated Federal income tax relief for educational expenses. The debate over suggestions for subsidies of that kind has been interesting in revealing some of the basic issues in public policy.

Institutions of higher education also receive great benefit from various tax provisions, but these are discussed later in another section of the chapter.

Clearly, a tax credit or deduction can help a family pay for education in the same way a scholarship or loan subsidy can. A credit is simple; the taxpayer determines the amount according to some official criteria and then subtracts it from the amount of tax due. The criteria can easily be arranged so that the basic goals of educational aid are fulfilled: they can be arranged so that aid goes to the poor, or to the intellectually able, or any other group. Naturally, reporting and auditing are more complicated if some criteria are used.

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[17] U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan*, pp. 68–72.

A deduction reduces the taxable income on which the tax rate is applied. The value of the subsidy to the taxpayer is:

$$S=mD$$

where S is the value of the subsidy, D is the allowable deduction from income, and m is the taxpayer's marginal income tax rate. Assume here that the tax saving comes in the same year as the educational costs, postponing for a moment the question of deductions for depreciation of educational capital.

Meeting the criteria for the giving of aid may require that the allowable deduction, D, be defined very carefully. If the income tax is progressive, as it is at the Federal level, the value of m is higher for richer people. This means that if two families are allowed the same deduction, the richer one receives a larger subsidy. If this is not desirable, the allowable deduction must be made smaller for higher income families, to offset the effect of the rising marginal tax rate. One easy way of doing this is to allow as a deduction only expenditures in excess of some minimum amount which rises as income rises. It is also not hard to define the allowable deduction so that if two families have the same income, the one incurring the higher costs not only gets a higher absolute amount of subsidy, but also a higher marginal rate of subsidy on the last dollars of cost, as was suggested as one plausible criterion in the previous chapter. Although some criteria cannot be met simply by allowing all costs to be deducted, some simple definitions of D will suffice to satisfy desirable criteria. Tax return instructions can be printed with tables to show the amount of allowable deduction as a function of family income and other variables. Such an arrangement would differ little from using the tax return filing process as a way of applying for scholarships.

Almost any sound principles will require that the effective subsidy to a family not be limited to the amount of tax owed. If the family merits an amount of subsidy which exceeds the tax liability calculated without regard to the relief, the credit or deduction must not merely reduce its tax bill to zero, but the net excess must be paid to the family in cash. This is an important change from present practice, because now no deduction or credit can reduce the next tax below zero, not even for the very poorest person incurring the very largest costs for which relief is given. Unless the present practice is altered, tax relief to poorer families would necessarily be severely limited, because they do not have very high tax liabilities against which to offset credits and their tax rates are so low that deductions do not help much either.

One argument for using the tax system to give subsidies is that income taxation already requires a well-organized, audited system of reporting income and payments. Bookkeeping costs may be saved if families claim subsidies and government pays them in the same system. And there are ample precedents for granting tax relief for certain meritorious expenditures. Some complications are raised in states which do not levy an income tax, of course, making the system harder to use for state government aid. And the advantages may seem minor or nonexistent when it is realized that every family must go through another well-established bookkeeping process, the college application process, while not every one must file a tax return. On the other hand, people who do file returns typically file them every year, while an application to college is made only for the first year. Which system is cheapest to administer is not clear. One problem with tax relief would be that of providing liquid funds for taxpayers to pay college bills. Taxpayers not filing estimated returns now file and receive refunds only well after they would pay the bills. To alleviate the problems this raises, estimated returns would have to be used more, with many families estimating refunds, or else a more complicated withholding system. All in all, it is not clear that using the tax system would be administratively more efficient than a scholarship plan extending aid on the same criteria.

But of course many persons who vigorously oppose some plans for tax relief do so on much more fundamental grounds. Many of the proposals do not make the effective subsidy inversely related to income, or do not allow the tax liability to become negative. People thus oppose them on the usual grounds that they give too much aid to high income families who don't need it and too little to poorer ones who do. But this has often been not subterfuge; rather some of the advocates of the legislation make relief to middle and upper-middle income families heavily burdened by college costs an explicit goal. There has been talk of redressing an imbalance supposedly created by older Federal programs which limit aid to lower income families, such as NDEA loans, partial payment of interest on guaranteed commercial loans, and educational opportunity grants. The tax relief plans are defended as fair, not as offering inducement to invest. The emphasis is on "relief," not on "incentive." They could also be defended in the same way as any plan which does not withhold aid from higher income groups, on the grounds that while the aid makes little difference whether people go to college or not, they do make a difference for the quality of education they get.

One plan for tax relief, which shares some basic characteristics with others in the same spirit, actually passed the Senate by a large majority (53–26) in April, 1967. It was offered by Senator Abraham Ribicoff, whose name is so much associated with tax relief plans that the whole idea is often called the "Ribicoff Plan," as a rider to a bill restoring the investment tax credit. The Kennedy and Johnson administrations had always opposed such efforts steadfastly. At the time hopes were dim that the House would go along, and the Senate dropped the rider a fortnight later.

The amendment would have given tax credits, estimated to cost the Treasury $1.3 billion annually by 1970, to parents and others who paid for tuition, fees, books, and supplies for college students. A $1.3 billion program is a giant as educational programs go. For taxpayers with incomes of $25,000 or less, the credit was to be 75 per cent of the first $200 of educational costs, 25 per cent of the next $300, and 10 per cent of the next $1,000. No credit was to be given for amounts above $1,500, so the maximum credit was $325. Taxpayers with incomes above $25,000 would lose one dollar of credit for each $100 of income above

$25,000. This meant that at an income of $30,000 the maximum credit would be $275, at $40,000 it would be $175, at $50,000 it would be $75, and at incomes of $57,500 or more there would be none at all, no matter how much was spent on college expenses.

It is easy to see why the bill's critics thought it would provide plenty of "relief," but be less useful in stimulating higher education than other possible uses of Federal funds. An income tax credit of two or three hundred dollars to a family whose income is in the twenty and thirty thousand dollar range seems to be too small to make much difference for its demand for education. Of course, one effect (widely predicted) of the plan would be to encourage colleges to raise their tuition, and *perhaps* the new revenue would be used to increase quality faster (but it might be used to replace other funds, such as state appropriations). Even if it did, some critics would argue that families would benefit from the increase in quality without paying any more out of their own resources, and that the result would still be a windfall at the expense of Federal taxpayers in general, one not much less objectionable because some external benefits also happened to be produced. It is interesting that at the same time such critics bemoaned the windfall of higher quality, others opposed the plan on the grounds it would merely allow tuition increases to wipe out any *cash* windfall from the credit.

The plan did attempt to reduce unfortunate redistributive effects. The percentage subsidy was designed to fall as educational expenditures rose, thus holding down the total subsidy to people who can already afford to pay high tuition. And there were actual reductions for very high income families. The particular sliding scale of subsidy, however, seemed to offer inadequate incentives at the margin, where it is most needed to induce willingness to pay for more costly education. The plan was perhaps weak, therefore, even if one admitted that high *quality* education is important for the social good. The plan offered a high subsidy (75 per cent) on the first $200 in costs, which certainly would have been spent anyway, then a low rate (10 per cent) on expenditures between $500 and $1,500, where a higher subsidy might make some difference, and finally none at all where it might make even more difference. The pattern of subsidy thus contrasts with the one suggested in the previous section, which defrays little of the costs a family is eager to pay by itself, but a significant part of the higher costs it scrutinizes more carefully. Finally, the Ribicoff proposal had the common defect of not permitting the effective subsidy to exceed what would otherwise be the tax liability. This not only meant it was of limited value to a lower income taxpayer, but also that the credit might be of less value than the credit given to a higher income taxpayer who actually spent less on education.

In addition to suggestions for immediate credits or deductions there has been the suggestion that the direct costs of college should be depreciated for tax purposes over a long period of time. Richard Goode has been one proponent of such a change in the Federal regulations to permit this to be done.[18] He feels a person should be allowed to capitalize personal costs of college education and professional, technical, and vocational education and write them off against earned income over a period of 10 to 20 years or more. Foregone earnings, because they are not taxed anyway, and living costs, since it is not clear that they are truly marginal to education, would not be included. That leaves tuition, fees, books and supplies, and travel expenses. The deduction, Goode argues, would be allowed to the student even if parents pay them, to make the treatment comparable to physical assets which are depreciable by the owner even if they are received as gifts. However, deductions would probably not be allowed for the costs defrayed by scholarships.

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[18] Richard Goode, *The Individual Income Tax*, Brookings, Washington, 1964, pp. 82–93. See also his essay, "Educational Expenditures and the Income Tax," in U.S. Office of Education, *Economics of Higher Education*, edited by Selma Mushkin, Bulletin 1962, No. 5, USGPO, 1962, pp. 281–304.

Goode's aim is to restore consistency to income tax principles, to allow a refinement of the definition of income, to improve equity and to produce "incidental consequences of a desirable character," [19] not to create large incentives to invest in higher education. He estimates neither the effects of the changes on educational expenditures nor the revenue loss to be large: by 1969–70 the deductible expenses might be a little over $3 billion, and the revenue loss about $.6 billion, but spread over a long period of time. Assuming a marginal tax rate of 20–25 per cent, the tax savings would be only about 3 or 4 per cent of total personal costs of college and university education under recent conditions, and the inducement this provides must be discounted because the saving comes only over a period of years.

WORK-STUDY PROGRAMS

The Economic Opportunity Act of 1964, which initiated the War on Poverty, authorized expenditures to pay needy students from low income families for part-time work while in college. The Federal government offered to pay a large part of the wages of working students (90 per cent at first, later 80 per cent). Later, the low-income family requirement was removed, replaced by the requirement only that the student needed earnings to continue at his college, although the college had to continue to give preference to students from poorer families. The justification for the change in requirements is interesting and sheds light on the whole question of who attends college:

> It is estimated that students from low-income families constitute less than 10 per cent of the total number of students who are in need of the earnings from part-time employment to pursue a course of studies at an institution of higher education. Since all students in need of these earnings are now potentially eligible, the changes in the law have increased tenfold the number of students who could be assisted . . .[20]

It is reported that almost 400,000 students earn an average of $450 per year under the program, so it is a major factor.[21] The selection and supervision of the working students is done by the colleges, who are granted funds for the purpose of paying the government's share of the wages. The college's share may be in tuition, books, room, and board. Actually, students need not work on campus, but may work for other nonprofit organizations and in various government anti-poverty and other programs.

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[19] *Ibid.* p. 93.

[20] Justification material of Office of Education in U.S. Congress, House Committee on Appropriations, Hearings, 89th Cong., 2nd sess., *Department of Labor and Health, Education, and Welfare Appropriations for 1967,* Pt. 2, USGPO, 1966, p. 233.

[21] U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan,* p. 9.

While recognizing the real value of this program, some have questioned it by asking who is really getting the subsidy. One suspects that some of the time spent working must be at the expense of time studying. If the working student sacrifices the quality of his education, what is happening of course is that the *rest* of the student body is getting some of the subsidy, because the college can reduce the costs it incurs and which must be financed by student fees.

> In some ways, this program may not really be a subsidy to the work-study student at all, but rather a general subsidy to the employing organization. If the work-study student would have gotten a job anyway, at the same wage, he is not aided by the program at all. For example, if the job is on-campus, the program would be providing Federal funds for the benefit of all students, because it replaces funds which the institution would have spent to provide necessary services.[22]

As this source goes on to indicate, however, there may be considerable value attached to the learning experience of the job, if it is not a menial one. Paid laboratory work may illuminate formal instruction in the natural sciences; and work in the real world may illuminate that in the social sciences. Financial aid officers say that some students definitely cannot work without it reducing the education they get, but they also say that for some freshmen working in a group can help adjustment to college life. In practice, then, a large question mark must hang over the work-study program.

GRANTS AND SUBSIDIZED LOANS TO INSTITUTIONS FOR BUILDINGS AND EQUIPMENT

The Federal and state and local governments have given very large amounts to colleges and universities by subsidizing specified resources bought by them, chiefly buildings and certain kinds of equipment, quite apart from the routine financing of buildings for public institutions. Grants or loans for college housing, classroom and laboratory buildings and equipment and library materials are major examples.

One of the oldest postwar Federal education programs, for example, is the college housing loan programs, in which schools can borrow form the Federal government to finance dormitories and dining halls and some other facilities. They can get long term loans at interest rates well below what they would have to pay outside, and they have borrowed several billion dollars over the nearly 20 years the program has been operated. At least lately, the requests for loans have greatly exceeded the maximum totals authorized by Congress, requiring severe rationing. The applications have always been screened with great care to make sure student charges will amortize the loans; the program was never intended to augment the low-interest subsidy by letting borrowers default.

The college housing loan program has recently been changed. Direct loans by the Federal government will be reduced sharply in amount and will be reserved for institutions unable to borrow in the private money markets. However, there are to be new payments of interest subsidies to facilitate such private borrowing; authorized in 1968 and first funded in a 1969 supplemental appropriation, they are to defray the difference between the rate a borrower pays and 3 percent.

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[22] *Ibid.*, p. 24.

More recent programs are grants and low interest loans for *academic* facilities, and these also have been funded at rather high levels. Some funds are reserved for graduate facilities, and over 20 per cent of the grant funds for undergraduate facilities have been reserved for two-year public community colleges and public technical institutes. This feature may be more acceptable to persons who want Federal aid to redistribute income, since lower income students are more likely to attend those institutions. It also helps some that the grants to such institutions are allocated by state according to a formula under which a state's share varies directly with the number of high school graduates in it and inversely with its per capital income. In all of these facility grant and loan programs, the Federal funds finance only a fraction of a building's total cost, a fraction typically somewhat below half.

However, these academic facilities programs may all but disappear shortly. The 1970 budget request is limited to $43 million for grants to community colleges. *No money* has been asked for academic facilities community colleges. No money has been asked for academic facilities loans or for grants to 4-year colleges or graduate schools. As in college housing, and at the same time, interest subsidies have been substituted to increase reliance on private lending and to reduce current budgetary expenditures.

In other major Federal programs grants are given for the purchase of science education facilities, library resources, instructional equipment, computers, and, very large, health education facilities. In addition, there is a large National Science Foundation program of general grants for various aspects of science education, in which some of the funds are specifically given for equipment.

Properly included in this category of aid for buildings and equipment are two other kinds of assistance which don't show up as the gift or lending of money, but are nevertheless subsidies. One of these is the routine exemption of property used for educational purposes from property taxes. An exemption is frequently specified in the State laws permitting local governments to levy taxes, and it is shared with some other nonprofit institutions. The exemption amounts to a subsidy for higher education relative to other products, because if the resources used to build property for an institution has been used instead for commercial property, the costs of the commercial product would have been higher by the amount of the property taxes. This effect, it is true, may be lessened if local expenditure is lower because the property is used for education and not something else. A college, for example, may pay for some of its own police and fire protection, and maintain its own streets and sidewalks. Or it may make voluntary payments in lieu of taxes. In some towns the presence of its faculty, employees, and students may increase the tax base more than they increase the need for public services. The subsidy, therefore, is not always as high as the local property tax rate times the assessed valuation of the exempt property. But for the nation as a whole the subsidy is substantial, and it is very important for some institutions. That fact is certainly appreciated by local taxpayers in some college towns.

It would be very difficult to estimate accurately the exact value of the subsidy from national data. Suffice it to say that the Office of Education estimates that at the end of the 1963–64 year all institutions, public and private combined, owned physical plant and land worth about $21 billion in book value.[23] Of course the really important thing is how the property would be assessed in various localities. For example if the effective loss in property taxes was as high as the equivalent of 25 mills on the book value, the subsidy would be over one-half billion dollars. Note that it does make sense to base such calculations on property held by public as well as private institutions.

Another of what may be called "hidden" subsidies is the one given by the Federal government to all state and local projects financed by bonds. There is no Federal income tax on municipal bond interest, so the interest costs are lower than on commercial projects. This is not a subsidy to higher education per se, because it is given to all expenditures financed by borrowing. But higher education does benefit, and it is the Federal taxpayer who shoulders the cost. The overwhelming part of this subsidy goes to students at public colleges and universities, but some states have established "authorities" which sell municipal bonds and reloan the money to private institutions.

One might object to all these subsidies on the same grounds as he objects to any aid given to institutions, because government cannot control the income levels of the students who ultimately benefit. A donor can hardly specify that only poor students be allowed to use the building he helps finance; that would be ridiculous if the college has a heterogeneous student body which uses the building in common, as seem inevitable and desirable. It would be possible to specify that it pass on the cost savings only to poor students by lowering their tuition or fees on a discriminatory basis but that is not the practice.

Others who care little about the income distribution effect may complain about the focus on particular resources. While accepting the need to subsidize education, why make it easier to buy bricks and mortar than other things? Why not also subsidize faculty salaries or clerical and custodial salaries? If we subsidize a dining hall, why not the food served there?

If there is room for variation in the way inputs can be combined to produce education—if substitution is possible—a subsidy on only one input will bias the producer toward combinations overemphasizing that input. Economists often object to subsidies which are not general in scope, and argue that the result is an inefficient allocation of resources, because the producer is not required to pay the full social costs of certain inputs. A subsidy on buildings alone, for example, biases choices toward an overuse of them at the expense of other inputs like labor:

> One disadvantage of categorical aid tied to a particular type of institutional input (e.g., computers) is that it gives institutions an incentive to purchase more of that item than they would have

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[23] U.S. Office of Education, *Higher Education Finances, Selected Trend and Summary Data*, U.S. Government Printing Office, 1968, p. 22.

> purchased if the aid were given in a more fungible form (e.g., formula grants). Federal aid for construction, for example, may induce some overspending on buildings or reduce incentives to use buildings more efficiently. It may distort institutional spending patterns away from what the institution itself would regard as optimum if given the funds to spend freely.
>
> To the extent that there is no overspending (i.e., categorical aid tied to the purchase of particular items is spent on items which would have been purchased anyway) categorical aid is simply an administratively costly method of dispensing fungible institutional aid.[24]

The loans for dormitories and dining halls may be open to still another complaint. This is that a lot of students' food and housing costs are not really marginal costs of education, but costs merely of living. Making them lower seems to be subsidizing something other than higher education. If the expenses of all students, rich or poor, are lowered there may be a special reason for not financing ordinary living expenses of rich students. And why not subsidize equally the routine living costs of commuting students who do not use college dining halls and dormitories but who may need the help more anyway? But it is true that only people who attend college in the first place can get the benefit of the lower prices for room and board, so the subsidies may really give some incentive to attend college. And they may give an incentive to live and eat on campus rather than off, with accompanying benefit for students and society, but not all would agree with this.

What other good things can be said in defense of aid for bricks and mortar, books and machines? Perhaps without it there would be unusual *obstacles* to colleges using particular inputs, obstacles which have undesirable effects themselves on how institutions combine resources to produce education. There may be undue hesitance at buying equipment needed for bold innovations, which educational leaders consider promising but which are not given a fair chance at most places. More generally, generous support for capital spending may have the effect of overcoming some natural reluctance by college trustees to undertake a debt burden which restricts their freedom in the future. Many institutions have appeared overly reluctant to borrow; some are timid even about liquidating small parts of their endowment to finance needed projects. They insist on waiting on new gifts from outside. Some of this may stem from the same lack of venturesomeness which shows up in conservative policies in investing endowment, which President Bundy of the Ford Foundation commented on several years ago. It is hard to explain for institutions who face a growing market and excess demand already for places in their student body, and thus little risk. Some less secure private institutions, however, may legitimately doubt they will always enjoy a strong market position in the face of the very low tuition that new high quality public schools can offer.

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[24] U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan*, p. 29. It should also be noted that some colleges accept public or private aid to construct a building without full awareness of the budgetary planning which must be made to keep it maintained properly.

They understandably do not wish to take on future fixed charges which will force them to "cater to the market" in order to enroll enough students to meet the obligations, for in their opinion, having to cater to the market unduly restricts their freedom. One may have mixed feelings about this line of reasoning, depending on the value he places on diversity, on the one hand, and on the *desirability* of catering to the market, on the other. But if the argument is valid, there is a case for sweetening government loans enough to persuade trustees to take them, or even for granting the money outright.

No one denies, however, that many of the loans and grants have been made to colleges and universities which were willing to borrow elsewhere if forced to, including public institutions who already enjoy substantial borrowing advantages in the open capital markets. Neither can the programs be strongly defended by saying that it is the building institutions which are expanding and thus meeting educational needs, for more general grants could be made conditional on the recipient's expanding enrollment without making them conditional on using particular inputs.[25]

GENERAL PURPOSE GRANTS TO INSTITUTIONS

The Federal Government gives only a little money to institutions which is quite free of any conditions, in that it is not tied to any particular input or training in specified disciplines. There are the longstanding grants to land-grant colleges, but these are quite small in total and can hardly be of much significance to many of the larger State universities which continue to receive them. In addition, there are the "developing institutions" grants started in the Higher Education Act of 1965. A developing institution is defined somewhat like an infant industry: it is supposed to have the potential to make a contribution to the Nation's higher education, but is still struggling for survivial. It was the general intent of Congress that this program primarily benefit Negro colleges. Since the recipients probably have fairly homogeneous student bodies, these grants are not subject to some of the criticisms made of general purpose grants. Although the grants are for general purposes, they are granted only after a definite plan for improvement is reviewed by the Office of Education, and emphasis is put on cooperation between developing institutions or between developing and well-established ones, through exchanges, joint use of facilities, etc.

But the State and local governments, it goes without saying, spend billions in general purpose grants, if we include the routine operation of low-tuition colleges and universities by public authorities. The low tuition institutions are an accepted part of American life, have expanded at a rapid rate, and are often regarded as offering what is as close as practical to free higher education. Yet they have come under increasing attack in recent years because of their practice of offering quality education at bargain prices indiscriminately to all comers. And there has been some trend to States granting assistance directly to students and to private institutions (witness the $24 million program in the state of New York for grants to private 4-year insitutions for the 1969–70 academic year, with the amount a college or university gets based on the number of degrees it grants). Surprisingly, low-price higher education may in the end be less vulnerable to the attacks than public elementary and secondary education is to the pressure for State aid to private schools at the lower level.

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[25] *Ibid.*

Public institutions are open to criticism by anyone who feels public aid should discriminate in favor of lower income groups. Since almost all generally charge all resident students the same tuition and since they spend very little on student aid, very few public colleges and universities discriminate in that way. They are thus very attractive to middle and higher income families; since many of theme are of high quality, and some of the the very highest, they are all the more attractive to people who would be willing, if forced to, to pay more for the quality they get. The public institutions have also been criticized for not enrolling their share of black students and of extremely disadvantaged students in general.[26] Their low student aid budgets do not permit them to do that, of course, since even at a low-tuition institution the real costs of attendance are burdensome enough for the very poorest families to require heavy student aid.

Consider the following statements:

> The willingness of many "private" institutions, at considerable sacrifice, to base undergraduate financial assistance on total need and to create in effect a sliding-scale tuition system supplemented by subsistence grants, accounts for the anomaly that these institutions have student bodies more representative of the income structure of the society than do most of their "public" counterparts whose low-tuition policies are defended as more "democratic." [27]
>
> * * * those of us who are in the middle and upper income classes have conned the poor into subsidizing us on the grand scale—yet we not only have no decent shame, we boast to the treetops of our selflessness and public-spiritedness.
>
> The facts are clear. Consider the typical city or state college or university. The average income of the parents of the students at such schools is much higher than average income of taxpayers, as every study has shown. More important—because this is the truly relevant comparison—compare the incomes that the young men and women now in college will have over the rest of their lives with the incomes that their contemporaries who do not go to college will have. * * *
>
> If tax monies are going to be used to subsidize the training of youngsters, surely equity demands that such subsidies go to the poorer among them—poorer not only in material wealth but in human capacities—not to the richer.[28]

The net impact of the public institution on income distribution depends not only on the characteristics of the students in it, but also on the taxpayers who help finance it. Criticism of some states has been all the greater because of their nonprogressive tax systems. On the other hand, it may not be fair to compare the distribution impact of the entire tax system with the impact of one kind of budgetary expenditure, especially since the net redistribution effect of all taxes and expenditures combined is quite favorable to the poor in many states. Also, it may be better to let the Federal government take on the job of redistributing income rather than relying heavily on state and local governments.

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[26] A recent survey of its members by the National Association of State Universities and Land Grant Colleges showed blacks were 5.3 percent of all students, but only 1.9 percent in a sub-category of 80 *predominately white* institutions. American Council on Education, *Higher Education and National Affairs*, May 16, 1969, p. 8.

[27] Truman, David, "Autonomy with Accountability," contribution to symposium on "Financing Higher Education," *The Public Interest*, Spring 1968, p. 106.

[28] Friedman, Milton, "The Higher Schooling in America," in *ibid.*, p. 108.

Some interesting empirical information is available on the single most important public higher education system in the country, California. The system includes the University of California, which has a number of campuses, the state colleges, and many public junior colleges. The system has been the object of increased discussion since it became involved in political controversy, some of the controversy being about its financing as well as other things. Hansen and Weisbrod studies the system, from the viewpoint of the economist, on the invitation of a committee of the California legislature.[29] A few of their conclusions were referred to in the previous chapter. In view of the discussion just presented, their conclusions on the income distribution impact are also interesting. They estimated roughly the distribution of the subsidies chaneled through the system to a typical cohort of high-school graduates. They found that 41 per cent received no subsidy at all, for not surprising reasons: about 1/3 of high school graduates obtained no higher education at all, and about 8 per cent attended private colleges in California or went out of the state. Less than $750 in subsidy were received by 14 percent of the population, between $750 and $2,000 by 30 percent, and over $2,000 by 15 percent (over $5,000 by 9 percent). These are estimates for all years of higher education a student attended.

> In short, there is a highly unequal distribution in the amounts of public subsidies given out, even though California prides itself on the wide access to higher education it provides and on the high enrollment figures which are presumably a reflection of this. It is obvious that the larger subsidies go to the people who complete 4 years at the University of California or the State College system, with the smallest subsidies going primarily to people entering the Junior College system. (pages IV–18–20)

The authors also estimated the distribution of subsidies by income class. Although the data are not perfect, they conclude:

> * * * the access to larger subsidies is related on average to levels of family income, with the highest single-year subsidy going to UC [University of California] students who already have somewhat higher (median) family incomes than those in the State College student population, which, in their turn, have substantially higher incomes than that of the Junior College population.
>
> * * * the distributions of students by parental income are so wide for each type of system . . . that any strong conclusions

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[29] Hansen, W. Lee and Weisbrod, Burton, *Benefits and Costs of Public Higher Education in California*, A Report to the Joint Committee on Higher Education of the California State Legislature, Madison, Wisconsin. 1967 (mimeo). The remainder of this section is based on this source. This report has been revised and published as W. Lee Hansen and Burton A. Weisbrod, *Budget Costs and Finance of Public Higher Education* (Chicago: Markham Publishing Co., 1969).

> about the "class-serving" nature of the entire system of higher education California cannot be drawn. While there is a tendency for the higher subsidy schools to draw a higher-income clientele, the overlap of the distributions is still very substantial. One must conclude, however, that this systematic pattern of differences raises questions regarding both the efficiency and equity of the entire system. (page IV–22)

Hansen and Weisbrod refrain from comparing the distribution of subsidies by income class with the distribution of state taxes paid, partly because of inadequate data on the taxes paid by families with college-age children, and partly because they did not wish to compare all taxes with benefits received from higher education alone.

VII. CONCLUDING THOUGHTS

The major issues in the public financing of higher education are: what kinds of students should utimately benefit from public aid? and how narrowly must they limit their choices in order to receive the aid?

The first of these is the major question for the Federal government. Federal funds are widely dispersed and lower the net price of education to students in many different kinds of institutions. They do not seem to carry any great defects of limiting choices open to families desiring to get the benefit of them. However, many can find some dissatisfaction with the income distribution effects of Federal programs if they feel that public aid should be largely limited to lower income students. The least one can say is that the large amounts given in some of the programs have income distribution effects beyond Federal control, because the money is channeled through institutions, which are free to set the prices they charge, and which frequently pass on the subsidies in the form of the same low prices to all students indiscriminately. But any argument that the effects on equity are unsatisfactory can be met with other arguments, that there is no particular reason why the effects of one single program must improve the distribution if the whole Federal budget does improve it, and that even aid to high income families induce them to demand—or accept institutions' decisions to give it to them—higher quality education which has important social benefits.

State governments still face both of the two issues. Many public institutions, especially in states without progressive tax systems, also seem to have income distribution consequences which can be defended only on the grounds that higher quality education can't be sold unless the price is very low, and that higher quality education is as important as mere attendance. In addition, despite the broadening of variety of institutions in recent times, and despite some increased help for private institutions, the subsidies granted by a state are still mostly channeled through relatively few colleges and universities, which students are restricted to if they want to benefit.

PART II

EFFICIENCY AND EQUITY IN HIGHER EDUCATION

The Search for Equity in the Provision and Finance of Higher Education*

W. Lee Hansen and ***Burton A. Weisbrod*****

INTRODUCTION

Who should be eligible for public higher education? Should those young people who are not eligible—or if eligible, are unable or unwilling to go to college—should they be deprived of the public subsidies obtained by the college goers? What can be said about the actual distribution of public subsidies for higher education—that is, who actually receives them? And who pays for them? These and related questions are explored in this paper, which is addressed to the subject of equity in the provision and financing of higher education. First, some conceptual issues are treated, and then a newly-available body of data is analyzed with the objective of determining how the benefits and costs of public higher education are actually shared in our most populous state, California.

I. EQUITY AND EFFICIENCY: CONCEPTUAL ISSUES

How should public higher education be financed? There are actually two separatable questions: one, *who* should bear the costs of public higher education; and two, *how* the portion of costs that is borne by students should be paid. More precisely, the question of *who* should pay involves determining the share of costs to be paid by students versus taxpayers.[1] The question of *how* students should pay relates directly to the tuition issue, but "the tuition" is not a simple concept. Should tuition be the same for all students? Whatever the level or levels of tuition, should it be paid at the time the education is received, or later? Should the level of tuition be determined at the time the education is received, or should the amount be contingent on future benefits?

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*Based on material in chapters 4 and 6 in W. Lee Hansen and Burton A. Weisbrod, *Benefits, Costs and Finance of Public Higher Education* (Chicago: Markham Publishing Co., 1969). See also W. Lee Hansen and Burton A. Weisbrod, "The Distribution of Costs and Direct Benefits of Public Higher Education: The Case of California," *Journal of Human Resources*, Spring 1969, pp. 176–191.

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[1] There is, of course, the question of how the taxpayers' portion of the costs is to be shared among various groups, but we do not deal with this matter.

The nature of these choices will be described more fully below. While our primary concern in this paper is with equity, we recognize that sound public policy should also strive for efficiency in the use of resources. Thus, we begin with a discussion of what we mean by "efficient" and "equitable" solutions to educational finance questions.

By "economic efficiency" we mean the degree of success of higher education in producing outputs (trained students, for example) that are more valuable than the resources used up in the process of production.

In the economy at large, the value of output is generally measured by what people are willing to pay for it; and, so, as a first approximation, the value of college education may be measured by the increased salaries that employers are willing to pay for workers who are college educated rather than only high-school educated. Efficiency, in the present context, can thus be thought of in terms of the amount by which National Income (or Gross National Product) is raised by higher education.[2]

But which people receive this increased income? And which pay the costs of the resources—teachers, classrooms, laboratories, etc.—that are required to produce the increased income? In other words, how "fairly" are the additional income and costs of public higher education shared? This is the issue of equity.

The distinction between efficiency and equity is essential if we are to come to grips intelligently with difficult issues of public policy. Higher education may be found to be efficient in raising incomes, but the method of financing higher education might be regarded as inequitable. By contrast, it may be felt that higher education is being financed equitably, but that it is really not an efficient way to use resources—there being better ways to increase people's real incomes (such as by devoting more resources to improving technology). Of course, there are intermediate positions, in which various degrees of inefficiency and inequity are adjudged to exist.

Debate over issues in higher-education-finance can only be fruitful if there is a recognition of when, and to what extent, the dispute centers on factual matters of efficiency, and when it centers on value judgments regarding the fairness of the distribution of benefits and costs. This is not to deny, however, that both classes of issues are difficult to resolve, for the factual data relevant to assessment of efficiency are difficult to find, as is consensus on what should be regarded as equitable.

The social objectives of efficiency and equity are in fact quite likely to conflict, thereby complicating the issue. Consideration of efficiency might suggest that higher education should be provided to some young people but not to all; implicit is the widely held assumption that not everyone can benefit significantly from higher education. But there is still the equity question: is it "fair" for some youngsters to receive public subsidies while others do not? An efficient allocation of resources can be inequitable.

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[2] But this is *only* a first approximation of the full value of college education, because it disregards benefits that arise in ways other than through the job market. We return to this point below. On the other hand, it disregards the fact that the increased salaries reflect not only the effects of schooling but also of the generally greater ability of those students who have opted for more schooling.

And an equitable allocation of resources can be inefficient. If, for example, *every* youngster were not only offered the opportunity to go to college for four years, but were required to go, then all college age people would receive a similar public subsidy. But if this is more equitable it is doubtless less efficient, for not everyone is likely to benefit enough to cover the costs of resources required to educate them. The conflict between equity and economic efficiency in higher education planning appears to be a genuine one; we do not attempt to resolve it here, but rather focus on the issue of equity itself.

Throughout this paper our attention is directed primarily to decision-making in the *public* sector. This orientation is somewhat artificial; the fact that there exists a private as well as a public sector in higher education means that success in devising an efficient and equitable finance system for public higher education does not assure either efficiency or equity for the higher education system as a whole. Our analysis of efficiency and equity issues in the financing of public higher education is applicable, though, to private as well as public higher education. The question of what separate and distinct roles ought to be fulfilled by the public and private sectors in higher education is an important one, but scant attention has been given to it. To have considered carefully the role of the private colleges, however, would have further complicated an already knotty matter.

EFFICIENT PRICING

Before embarking on our detailed investigation of equity, we turn to a brief analysis of some implications of seeking efficient pricing of higher education. As already noted, both kinds of considerations are relevant to the evaluation of alternative methods of financing public higher education.

The cost of a college education to a student and his family—apart from the income foregone—can be analyzed in two parts. One is what can be termed the "price" of the education—the tuition charge, the books and supplies, and so forth. The second is the "ease of financing" that price—that is, the availability and terms of loan funds and scholarships.

The level of the price of college education, and the ease of financing it are jointly relevant to individuals' decisions. An apparently high tuition rate may be quite manageable if grants or scholarships are widely available or if loans can be obtained at sufficiently low interest rates. Similarly, even a total failure of scholarship programs and capital markets to provide financing assistance can turn out to be inconsequential if the total price of education (including foregone income) is sufficiently low. Thus, there would seem to be trade-off possibilities between the price of education and the means of financing it—combinations among which any particular individual would be indifferent.

But considerations of public policy dictate that we go beyond an analysis of any individual's preferences to take account of all the resources used up in the process of satisfying those preferences. Thus, we are led to consider the questions of what is a socially efficient price of education, as well as what is a socially efficient set of finance terms, including an interest rate.

Economic efficiency may be said to exist in a market when the price of the good or service is equated with the marginal opportunity cost (value of the best alternative use) of the resources used to produce it, and both are equated with the benefits from an additional unit of the good. Thus, given the distribution of income, the preference of all individuals in society, and the technological production possibilities, the efficient price for any given unit of production (e.g., man-year) of higher education is the price which is equal to the marginal *net* social cost of providing that education and the marginal benefit received by *the* student. By net cost we mean the marginal cost of production *minus* any marginal "external" benefits—that is benefits that are not captured by the individuals whose education produced them.[3] To the extent that such external benefits occur, the efficient price to charge students would be below the marginal cost of producing the education services.[4]

This view of pricing clearly implies that society (taxpayers in general) should subsidize higher education as a matter of efficiency. Since some external benefits may be realized within local areas while others may be distributed more broadly, all levels of government—federal, state, and local—would presumably share in the costs. Insofar as the bulk of externalities accrue at the national level—in part because of population migration—this would argue for a reallocation of public financing of higher education away from state and local governments and to the federal government.

Public subsidies can take a variety of forms. In addition to "low" tuition rates, there are low-cost loans, income tax credits or deductions to parents, and outright cash grants to students—all of which can be equivalent to a tuition reduction. Any of these forms, and no doubt others as well, could be used to produce the desired public subsidy and, in turn, result in an efficient "price." The choice among them rests largely on an equity consideration—that is, the extent to which persons not in "need" would benefit.[5]

There are some individuals who may be "qualified"[6] for college but who will not attend college because the combinations of available price and interest charges are "excessive" relative to their financial situation and to the strength of their desire to attend. The willingness to incur these costs is conditioned by factors including family income and wealth, family size, and parental health. Yet there appears to be a social concensus that these factors ought not to bar college attendance, so that "needy" individuals with the ability and motivation to benefit from college should go.

If compulsion is to be avoided, these barriers to college attendance could be offset in three general ways: (1) incomes of such students and their families might be supplemented; and/or (2) the price of college education for them could be reduced; and/or (3) the interest rate applicable to their borrowing for college could be reduced.

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[3] At the conceptual level, the possibility of external costs as well as benefits should be considered. It is not generally argued, however, that such costs are notable, if, indeed, they occur at all in higher education.

[4] It is difficult to estimate marginal costs, but it might reasonably be assumed that long-run marginal cost can be approximated by average instructional plus capital costs.

[5] For further discussion of this issue in the context of income redistributional programs see Burton A. Weisbrod, "Collective Action and the Distribution of Income: A Conceptual Approach," in U.S. Congress, Joint Economic Committee, Subcommittee on Economy in Government, *The Analysis and Evaluation of Public Expenditures: The PPB System*, 1969.

[6] It seems clear that there is considerable arbitrariness in deciding who is "qualified" to benefit from a college education.

One might argue that the judgment that a student "should" go to college, even though family circumstances would lead him not to go, represents an implicit social decision that his family's income is "too low." Thus, an increase in family income would seem called for. If the objective, however, is to make it possible for this student to attend college *at a minimum cost to others*, then the approach of giving to needy students cash transfers that are not restricted as to use, is likely to be inefficient; very substantial transfers might be required before any of the additional money would be used for the student's higher education. A possible variant is to restrict the use of cash grants to higher education. But this alternative may be difficult to implement, since as a practical matter there is no means for preventing some of the grant money from going to families—even some of them with very low incomes—whose children would have gone to college anyway, and who now, having received the grant, will be able to increase their expenditures on other goods and services. Grants to such families are not necessarily undesirable, but the point is that grants may not be required to achieve *educational* objectives, however justified they may be from the point of view of a more general anti-poverty effort.

Consider now the alternatives of reducing the price and/or interest rate for the "needy." If, to begin with, the price and interest rate were set at levels that were economically efficient—in terms of the costs involved, as discussed in the preceding section—then further reductions would sacrifice some allocative efficiency in order to bring about effects that were deemed more equitable. Such a trade-off of efficiency for equity is by no means unique to higher education, nor is it necessarily undesirable.

In practice, each of the alternatives is bound to fall short of fully realizing equity objectives. Subsidies, whether in the form of cash, tuition rate reductions, or reductions in interest rates, are certain to go to some persons other than those whom "society" specifically wishes to assist, since the "needy" and "deserving" are frequently difficult to identify. Thus, subsidies go, at least to some extent, to the "wrong" people—with taxpayers, some of whom are themselves worthy of help, paying the cost.

Some perspectives on the dimensions of need can be obtained by a theoretical disaggregation of the population into several different groups. Group I includes those students (and their families) who are willing and able to pay at least the full long-run marginal cost (which we suggested above might be approximated by average instructional plus capital cost) net of estimated external benefits, and the full market interest rate. A portion of this group, while willing to pay these costs, can do so only by incurring some "hardship." Group II includes those who are willing and able to pay some lower, positive price and interest rate, and some fraction of this group could pay these amounts only with some hardship. Finally, Group III includes those people who would need bribes to cause them to attend college, being unwilling to attend at any combination of a positive price and positive interest rate. All three groups are defined to include only those deemed "eligible"—in terms of aptitude and motivation—to attend college.

One of the implications of the structuring of these three groups is that the amount of subsidy required to cause an individual to attend college is a continuous variable with a wide range of values. Some students will require very substantial subsidies and others none at all in order to provide full equality of opportunity in higher education.

Identifying those who are deserving of additional subsidies to enable them to go to college or to go without undue hardship is a most difficult task. Assume, however, that the "need" for higher-education subsidies can be estimated in a satisfactory, if rough, manner, perhaps applying the standards used in student financial aid analyses. The perplexing question then is who should pay for these equity-based subsidies? Utilizing taxpayers-in-general as a source of revenue, while having merit, does imply that any sum of money that students and their families "cannot afford" to pay, *can* be paid by, and *should* be paid by taxpayers. But when it is borne in mind that "taxpayers-in-general" include many quite low income taxpayers, it becomes clear that a shifting of the financial burden from students and their families to taxpayers involves to some extent, a shift of the burden to families whose incomes and ability to pay may be less than the ability to pay on the part of students and their parents.

This raises a more fundamental issue of the meaning of "ability to pay." Just as standards have been established for determining how much a family can "afford" to pay for *higher education*, so might standards be established to determine how much a family could "afford" to pay in *taxes*. If such a study were done, it might well conclude that families of given size, given needs, and with incomes below some specified amount, could not afford to pay any taxes at all; nevertheless, we suspect that many such families are, in fact, actually paying taxes—and would be required to pay even more taxes if State support for higher education were increased.

Another possible source of subsidy funds for the needy is other college students and their parents. We noted above that there are some families, particularly in Group I, who are able and willing to pay more than the efficient price of education. If they were charged a higher price, the subsidies required for needy students could be obtained outside the tax system. This would amount to the use of classic price discrimination, to charge what the traffic will bear. One might think of the resulting schedule of charges as reflecting a sliding-scale college payment plan, with the possibility of negative charges for the most needy.[7]

On the assumption that a choice can be made regarding the most appropriate subsidy device for achieving greater equity, there is still a larger issue concerning the propriety of limiting subsidies to those who choose college rather than some other means for enhancing individual and social well-being. For the many young people not deemed qualified for college or not interested in attending college under any reasonable pricing conditions, there is a variety of other methods by which they can enhance their incomes and future satisfaction, and otherwise become effective citizens. Job-training and investments in small businesses are only two substitutes to college-going. Whether from the standpoint of achieving equity or efficiency in resource allocation, it would be highly desirable to make these and perhaps other alternatives available to those young people who do not opt for college. A broadened subsidy program might well be more costly. But it would at the same time do much to provide greater equality of opportunity for *all* young people, not merely for college students.

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[7] Michigan State University has been experimenting with such a plan though in a quite restricted form. The sliding-scale approach is also implicit in cases where the size of scholarships is a function of "need."

The revelance of the proposal for broadening the subsidy base will become clearer as we turn to the empirical results of our investigation of how the benefits and costs of public higher education are shared in California. We see that a large percentage of all young people receive no public subsidy at all through the public higher education system, while a small percentage receives very substantial public subsidies.

II. THE DISTRIBUTION OF COSTS AND DIRECT BENEFITS OF PUBLIC HIGHER EDUCATION: THE CASE OF CALIFORNIA

The public higher education system in the United States provides—or, at least, offers—a public subsidy to young people of college age. The extent to which the young people actually receive the subsidies depends on (1) whether they can qualify for admission, (2) whether they avail themselves of the opportunity to attend, and, if they do, (3) what quantity and quality of education they receive. As a result, the amount of subsidy received through the public financing of higher education varies greatly from one person to another. Our objective in the remainder of this paper is to estimate (1) the amounts of subsidies received through higher education, (2) the variation in subsidies received by students depending upon the amount of schooling and the kind of schooling they obtain, and (3) the extent to which these subsidies are received in different amounts by students whose families are at different socio-economic levels.[1]

Attention is restricted to undergraduate education, and the data used are for public education in California. While higher educational systems differ among states, it would appear that the results for California are broadly characteristic of those for a number of other states.

A knowledge of the magnitude and distribution of subsidies or direct benefits provided through public higher education, or indeed, through any public program, is important for what it suggests as to appropriate pricing, tax, and expenditure policy. By "appropriate" we mean policies that will be efficient, in the sense of doing the most to raise output, and at the same time equitable, in the sense of doing the most to achieve society's distribution goals, such as providing greater equality of opportunity for young people. We can illustrate some of the possibilities. For those "eligible" for higher education, uniform subsidies may provide a "windfall" to the more financially able while doing little to facilitate college attendance by the less well-off. This might argue for some kind of flexible pricing system in higher education, though much the same effect might be achieved less directly through the tax system. For those not eligible for public higher education, the provision of other kinds of subsidies or direct-benefit program may not only yield substantial benefits to others but also help to achieve greater equality—of both educational opportunity and of opportunity in general.

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[1] Little effort seems to have been given to this subject. For one interesting and perceptive foray, see Christopher Jencks, "Social Stratification and Mass Higher Education," *Harvard Education Review*, Spring 1968.

Subsidies Students Can Receive

The amounts of public higher education subsidies that college students can and do receive are the difference between tuition and the costs—instructional and capital—of providing instruction to them. The size of this difference for any student depends on the number of years of instruction received, and the subsidy per year of schooling. The latter, in turn, depends essentially on the costs of the particular college, and on its price (primarily tuition).

In 1965 the public subsidy provided through higher education in California ranged from $720 for a year at a Junior College to $1,350 and $1,450 for a year in the lower division (first two years) at a California State College and at the University of California, respectively. But the one-year subsidies tell only a portion of the subsidy story, for while some students may attend a public college for only a year or even less, others attend for four years or more. And not only do those who attend for longer periods receive larger subsidies for that reason alone, but also because the subsidies increase as students progress to the upper division levels. For California, students who complete a two-year Junior College Program receive an average subsidy totaling $1,440, while those completing a baccalaureate program at a State College receive four times as large a subsidy—$5,800—and graduates from a University of California campus receive a four-year subsidy of more than $7,100. The actual amounts of subsidies vary, depending upon patterns of transfer among these three segments of the California public higher education system.

The proportions of entering students completing each segment of higher education vary considerably, from about 60 percent at the University, to 55 percent at the State Colleges, and to 30 percent at the Junior Colleges.

But even this is deceptive, since many eligible students do not avail themselves of any public higher education. Some prefer to enter the work force, others enter the military service, and many females marry and do not continue their schooling. Still others enroll in private institutions of higher education in California, while another but smaller group seeks higher education outside of California.

Of those who do enroll in public higher education in California, the proportions eligible for each segment who actually enroll in that segment is often very low. For example, of the 19 percent of high school students eligible for the University of California in 1965, only 5 percent planned to enroll at the University; another 4 percent planned on going to State Colleges, 5 percent to Junior Colleges, 3 percent to other institutions, and 2 percent planned no further education. Of those 17 percent eligible for State Colleges (but not for the University), 2 percent planned to enroll at a State College, 8 percent at the Junior Colleges, and 4 percent did not plan to enroll at all. And with respect to the Junior Colleges, for which all students are eligible, only some 30 percent of high school graduates planned to enroll; this constituted one-half of the 64 percent of high school graduates who were not eligible (on the basis of scholastic performance in high school) for either the University or a State College. Thus, whatever their reasons, many high school students enroll at public institutions of higher education in California which provide subsidies smaller than those for which they are eligible.

Just as the amount of public subsidy varies among the three segments of the California higher education system, so do the attrition rates. Students who enter a Junior College not only receive the smallest subsidy per year, but they are most likely to remain in school for only a short time. By contrast, students who enter the University of California receive a far greater subsidy per year and are most likely to receive that subsidy for four years, until graduation. The high attrition rate at the Junior College level reflects in part the fact that a number of its programs require only one year of schooling. The rate of attrition at the State Colleges is somewhat lower, and attrition at the University of California is the lowest, largely as a result of its greater selectivity in admissions.[2] Its first-year attrition rate—15 percent—seems rather high, but the four-year completion rate of 55 percent is within the range for most other comparable four-year institutions. However, an additional three percent of the initial entrants to the University of California completed their work at a State College, and some others undoubtedly graduated from colleges outside the California system of public higher education.

DISTRIBUTION OF AMOUNTS OF SUBSIDIES

We have constructed a rough distribution of the percentage of an age cohort of high-school graduates who receive different amounts of public subsidies for higher education, utilizing data on instructional and capital costs, transfer patterns among the three systems, and attrition rates. This information is summarized in Table 1. The rather startling conclusion is that while a small proportion—9 percent—receives rather large subsidies, exceeding $5,000, more than half of California's young people receive under $750 in total subsidy from higher education. And a substantial fraction—41 percent—receive no subsidy at all. This group is divided between those who obtain no higher education whatsoever—almost 80 percent—and those who plan to attend private colleges within California—or colleges outside the state—about 20 percent.

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[2] For additional details see *Benefits, Costs, and Finance of Public Higher Education, op. cit.*, chapter 4.

TABLE 1.—*Estimated distribution of public subsidies for higher education based on amount received during period enrolled*

Amount of subsidy:	*Percentage of persons receiving*
0	41
$1 to $749	14
$750 to $1,999	30
$2,000 to $3,499	3
$3,500 to $4,999	3
$5,000 to $6,499	6
$6,500+	3
Total	100

In short, there is a highly unequal distribution in the amounts of public subsidies actually received, even though California prides itself on the wide access to higher education it provides and the high enrollment ratios which are presumably a reflection of this. Moreover, there is little reason to believe that the distribution of public subsidies through the higher education is less unequal in other states than it is in California. No state has as widely accessible a junior college system as does California; thus, other states probably have larger proportions of young people who obtain little or no college education.

DISTRIBUTION OF SUBSIDIES BY FAMILY INCOME

What can be said about the distribution of subsidies provided through higher education when measured against students' family income levels? While this is a difficult question to answer with the available data, we have tried to shed light on it.

To begin with, it is useful to examine the patterns of college-going by level of family income. These are shown in Table 2, where columns 3–6 show the family income distributions for all California public college students in 1964, column 2 shows the income distribution for families without children in California public higher education, and column 1 shows the distribution for all California families.

The distributions by family income clearly differ among the groups shown. Median family incomes (see bottom row of table) are highest for parents of University students, followed by State College student families and Junior College student families. Lowest of all is the median for all families without children in the California system. (This is heavily weighted with elderly and, on average, low income families.) These patterns are about what one might expect and, in general, conform to the patterns shown in other surveys.[3] Thus we conclude that access to subsidies is positively related to levels of family income, with the highest single-year subsidy going to UC students

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[3] For example, see the Wisconsin data in L. J. Lins, A. P. Abell, and D. R. Stuckl, *Costs of Attendance and Income of Madison Campus Students, The University of Wisconsin, 1964–1965 Academic Year*, Office of Institutional Studies, January 1967; I. M. Boyak, A. P. Abell, and L. J. Lins, *Costs of Attendance and Income of University of Wisconsin-Milwaukee Students, 1964–1965 Academic Year*, Office of Institutional Studies, March 1967; and L. J. Lins, A. P. Abell, and R. Hammes, *Costs of Attendance and Income of University of Wisconsin Center Students, 1964–1965 Academic Year*, Office of Institutional Studies, May 1966.

(and their families) who already have the highest median family incomes ($12,000).[4]

Table 2.—*Distributions of families by income level and type of college or university, California, 1964*

[In percent]

Income class	All families	Families without children in California public higher education	Families with children in California public higher education			
			Total	JC	SC	UC
	(1)	(2)	(3)	(4)	(5)	(6)
0 to $3,999	16.1	17.0	6.6	8.1	4.1	5.0
$4,000 to $5,999	14.8	14.9	13.0	15.9	10.2	7.5
$6,000 to $7,999	18.9	19.0	17.6	19.6	17.0	11.1
$8,000 to $9,999	18.1	18.3	16.4	16.9	17.2	13.1
$10,000 to $11,999	12.4	12.1	15.8	14.4	19.9	13.3
$12,000 to $13,999	7.4	7.3	8.8	17.2	10.8	11.3
$14,000 to $19,999	7.9	7.5	13.0	11.1	13.0	20.3
$20,000 to $24,999	1.8	1.6	3.4	2.6	3.3	6.6
$25,000 plus	2.6	2.3	5.4	4.2	4.5	11.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Median income	$8,000	$7,900	$9,560	$8,800	$10,000	$12,000

Source: Col. 1—Letter from Office of Legislative Analyst, California Legislature, in *Tuition for California's Public Institutions of Higher Education*, Joint Committee on Higher Education hearings, Oct. 13 and 16, 1967; see tab T, table 1. Col. 2—Estimated by the authors. Col. 3—Weighted average of cols. 4, 5, and 6. Col. 4, 5, 6—Edward Sanders and Hans Palmer, *The Financial Barrier to Higher Education in California* (Claremont: Pomona College, 1965), table M, p. 21, which relates to distribution of parent-supported students only.

We can present some crude figures to illustrate the association of family income and subsidies-received, by comparing median family incomes for the groups shown in Table 2 with the amounts of the subsidies going to each of these groups. Table 3 presents our estimates of these data. Median income of families of various types is shown in line 1, the one-year subsidy received is given in line 2a, and the subsidy as a percentage of family income is presented in line 2b. Because students first enrolling at each type of institution do not remain in college equally long, the average number of years they are enrolled is also shown, in line 3. The total subsidy received is shown in line 4a, and the percentage of family income that the subsidy constitutes is in line 4b. Because students transfer among the three higher education systems, the average subsidy is not simply the product of the average subsidy in a particular system and the average number of years of schooling obtained by students who *begin* their schooling in that system. As indicated by line 2b, the values of the single year subsidies vary from zero percent of family income for those without children in public colleges and universities (some of these people may have children in private colleges or in public colleges not in California), to 14 percent of family income for those families with State College students.

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[4] Were we to relate the data shown in Table 2 to the data on subsidies received over the entire college stay, the differences in the subsidies received would be accentuated. The reason is that University of California students are more likely to complete four years than are State College students, and the latter are more likely to complete four years than the vast bulk of the students who begin at Junior Colleges.

TABLE 3.—*Average family incomes and average higher education subsidies received by families, by type of institution children attend, California, 1964*

	All families (1)	Families without children in California public higher education (2)	Families with children in California public higher education			
			Total (3)	JC (4)	SC (5)	UC (6)
1. Average family income [1]	$8,000	$7,900	$9,560	$8,800	$10,000	$12,000
2. Average higher education subsidy per year: [2]						
(a) Amount in dollars		0	$880	$720	$1,400	$1,700
(b) Percent of line 1		0	9	8	14	13
3. Average number of years of higher education completed [3]	(4)	(4)	(4)	1.2	2.6	2.8
4. Average total higher education subsidy: [3]						
(a) Amount in dollars		0	$1,700	$1,050	$3,810	$4,870
(b) Percent of line 1		0	18	12	31	41

[1] Median incomes from table 2.

[2] Average subsidies are based on the distribution of enrollment by year of school and on distribution of enrollment by type of institution.

[3] Authors' estimates based on data in *Benefits, Cost, and Finance of Public Higher Education*, op. cit., tables 1, 2, and 3. Because students transfer among the 3 higher educational systems, the average subsidy shown in line 4(a) is not obtained simply by multiplying line 2(a) by line 3.

[4] Not available.

The average overall subsidy is equal to 9 percent of current money income for all parents of public-enrolled college students (line 2b, column 3), but the subsidy climbs to 18 percent of family income when we take account of the number of years that the educational subsidy is received (line 4b, column 3). Because, as noted before, the amount of schooling received differs, the average total subsidies (line 4a) rise far more sharply than the single year subsidies (line 2a), as we contrast the families with children enrolled in California Junior Colleges, State Colleges, and University campuses. These patterns of subsidies raise serious questions about the equity of the current system for financing public higher education in California.

At the same time, however, the distributions of students by parental income (as shown by each of the columns in Table 2) are so wide for each type of system—University of California, State College, and Junior College—that any strong conclusions about the "class-serving" nature of the entire system of higher education in California cannot be drawn. While there is a tendency for the higher subsidy schools to draw a higher-income clientele, the overlap of the distributions is still very substantial.

Some added light can be thrown on the equity issue by a restructuring of recent data presented by the California Coordinating Council for Higher Education.[5] The data from several of its tables have been combined to show how eligibility and plans for higher education enrollment vary systematically with income.

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[5] Coordinating Council for Higher Education, State of California, *Financial Assistance Programs*, 67–13 (Second Revision) October 31, 1967, Table I–2, p. I–9; Table I–3, p. I–10; and Appendix Table B–3.

We see in Table 4 that under 20 percent of the high school graduates qualify for the substantial University subsidies; this is a product of the academic entry requirements. Even more striking is the fact that the percentage of all students qualifying for the University of California (column 1) rises quite dramatically by family income level—from about 10 percent in the lowest income bracket (under $4,000) to 40 percent in the highest (over $25,000). Thus, the correlation between high school achievement and family income—and all that it reflects—is startling indeed. This pattern persists as we widen our view to include those eligible for both the University and those who are eligible for State Colleges (column 2). But a close examination of the differences between the two columns shows that the percentages of those eligible only for the State College system is roughly constant with respect to income level; thus, University eligibility requirements account largely for the unequal distribution of opportunity.

The extent to which family income influences the likelihood that a student who is *eligible* for a high-subsidy school will go to it is indicated in Table 5. For the University (column 1) a larger fraction of upper than lower income students plan to attend; the same holds for the combined University-State College system group (column 2); and the pattern continues—though in somewhat muted fashion—when we consider all high school graduates (column 3). Actually, these results are somewhat deceptive since those eligible for a "higher" system can also attend a "lower" system.

TABLE 4.—*Distribution of high school graduates by eligibility for public higher education in California, by type of education and family income*

	Percentage distribution of high school graduates by eligibility for—	
Family income	University of California (1)	University of California and State colleges (2)
$0 to $3,999	10.7	28.0
$4,000 to $5,999	11.5	26.3
$6,000 to $7,999	11.9	30.5
$8,000 to $9,999	16.2	33.2
$10,000 to $12,499	19.4	37.1
$12,500 to $14,999	22.5	39.8
$15,000 to $17,499	27.9	45.4
$17,500 to $19,999	29.5	45.1
$20,000 to $24,999	33.3	46.1
$25,000 plus	40.1	54.3
Not reported	13.3	28.0
All	19.6	36.3

Source: Based on data from CCHE, *Financial Assistance Programs*, 67-13 (2d revision) Oct. 31, 1967, table I-2, p. I-9; table I-3, p. I-10; and appendix table B-3.

NOTE.—Excluded from the sample of 8,162 were 302 students planning vocational training, 38 nonrespondents on enrollment plans, and 20 for whom eligibility was indeterminate.

TABLE 5.—*College attendance plans of California high school graduates, by family income and higher education segment, 1966*

Family income level	Percent of UC eligibles planning to attend UC (1)	Percent of UC-SC eligibles planning to attend either UC or SC (2)	Percent of all California high school graduates planning to enroll in UC, SC, or JC (3)
0 to $3,999	30.4	22.5	53.1
$4,000 to $5,999	26.1	29.7	56.1
$6,000 to $7,999	23.4	28.1	56.3
$8,000 to $9,999	21.5	36.5	60.0
$10,000 to $12,499	25.3	32.6	62.0
$12,500 to $14,999	26.2	37.5	64.6
$15,000 to $16,999	26.9	32.1	63.4
$17,000 to $19,999	33.3	45.7	64.2
$20,000 to $24,999	45.4	52.0	68.2
$25,000 plus	46.7	47.8	57.8
No response	30.5	30.1	47.9

Source: Same as table 4.

Note: UC (University of California); SC (State colleges); JC (junior colleges).

Indeed, when we compare the percentage of University-eligible students planning to attend one of the three public systems, we find that the proportion is fairly constant with respect to family income, at about 70–75 percent (these data are not shown in the accommpanying tables). Much the same kind of pattern emerges for both the University and State College eligibles who plan to undertake higher education. The point, however, is that enrollment in a lower system—often dictated by family income considerations—implies a reduced level of subsidies.

WHO PAYS THE TAXES?

Having shown the extent to which families in different income groups are awarded subsidies through the fiscal system by virtue of the provision of higher education, we turn now to the question of how these subsidies are financed. Specifically, we estimate distributions of state and local taxes paid by families at each income level. The objective is to provide a basis for comparing the subsidies received with the tax payments made. Such information is essential in assessing the equity of the current methods of financing higher education in the State of California.

Our approach is to estimate the incidence of the most important state and local taxes by family income level, so as to note the absolute amount of taxes paid at each income level. We can then compare this amount with the subsidy received and note any differences. But we still have no real way of determining how much of whatever taxes are paid reflect support for higher education, as against the many other services provided by state and local governments.

The average amount of taxes paid at each income level as well as the effective tax rate, for California state taxes alone, and for state and local taxes combined, is shown in Table 6. The most important finding is that while the state tax structure (column 2) seems to be somewhat progressive—that is, the effective tax rate rises with income—except in the lowest income classes, the combined state and local tax structure (column 4) is regressive below $8,000 and is essentially proportional above that level.[6]

We return now to the major task of this section—to compare the taxes paid with the subsidies received by families with children enrolled in college, so that we can observe the extent to which broad groups of families do or do not receive net subsidies through higher education. In making such comparisons we once again remind the reader that this involves comparing *all* taxes with benefits received from higher education *alone*. As shown by Table 7, the annual value of higher education subsidies (line 2) received by a family with a single child enrolled in a public college exceeds the total amount of all state and local taxes they pay (line 3), by rather substantial amounts. On an overall basis the average higher education subsidy is $880 per year (line 2, column 3), in contrast to total state and local taxes paid of $740 (line 3, column 3); this results in an annual net transfer of $140 from all taxpayers to parents of each college student. But this average conceals wide differences by type of college.

Table 6.—Estimated tax burdens by income class, California, 1965

Adjusted gross income class	State taxes only per family [1] (1)	Effective State tax rate [2] (2)	State and local taxes per family [3] (3)	Effective State and local tax rate [3] (4)
0 to $3,999	$104	5.2	$474	23.7
$4,000 to $5,999	132	2.6	527	10.5
$6,000 to $7,999	161	2.3	576	8.2
$8,000 to $9,999	221	2.4	696	7.7
$10,000 to $11,999	301	2.7	833	7.6
$12,000 to $13,999	389	3.0	964	7.6
$14,000 to $19,999	539	3.2	1,228	7.2
$20,000 to $24,999	865	3.8	1,758	7.8
$25,000 plus	2,767	5.5	4,093	8.2

[1] Personal income, States sales, cigarette, and alcoholic beverage taxes only.

[2] Taxes as a percent of estimated mean income of each income class. The mean of the highest income interval was arbitrarily assumed to be $50,000.

[3] State taxes include personal income, sales, cigarette, alcoholic beverage, and gasoline taxes. Local taxes include local sales and property taxes.

Sources: Personal income, sales, cigarette and beverage taxes by income level were obtained from letter from Office of Legislative Analyst, State of California in *Tuition for California's Public Institutions of Higher Education*, Joint Committee on Higher Education, hearings, Oct. 13 and 16, 1967; see tab T, table 1. State gasoline taxes and local property taxes were based on itemized tax deductions reported on State income tax returns, 1965, and summarized in Franchise Tax Board, *Annual Reports, 1965* and *1966*, table 13. Local sales taxes were assumed to be distributed in the same manner as State sales taxes above. Since local sales tax revenues in 1965 equaled one-third of State sales tax revenues, this factor was applied to the estimated amount of State sales taxes in each income level.

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[6] The recent, 1967, changes in the California state income tax structure have increased, but only slightly, the overall progressivity of the state tax structure.

TABLE 7.—*Average family incomes, average higher education subsidies received, and average State and local taxes paid by families, by type of institution children attend in California, 1964*

	All families	Families without children in California public higher education	Families with children in California public higher education			
			Total	JC	SC	UC
	(1)	(2)	(3)	(4)	(5)	(6)
1. Average family income [1]	8,000	7,900	9,560	8,800	10,000	12,000
2. Average higher education subsidy per year [2]		0	880	720	1,400	1,700
3. Average total State and local taxes paid [3]	620	650	740	680	770	910
4. Net transfer (line 2—line 3)		−650	+140	+40	+630	+790

[1] From table 2.

[2] From table 3.

[3] Total State and local tax rates from table 6 were applied to the median incomes for families in each column.

For families with a child at one of the State Colleges or one of the University campuses, the net transfers range from $630 to $790 per year. Meanwhile, families without children or with children not enrolled in public institutions of higher education receive no subsidy whatsoever, while they pay an average of $650 in state and local taxes. This is not to suggest that such families should pay no state and local taxes, for some may have benefitted in the past, others may benefit in the future, and still others may have opted for more expensive non-public California higher education. Moreover, state and local taxes finance public services other than higher education. In any case, as is evident from a comparison of line 4 and line 1, the current method of financing public higher education leads to a redistribution of income from lower to higher income families; indeed, there is very substantial progressivity in the resulting pattern of transfers.

CONCLUSION

Public policy regarding higher education must consider a number of factors among which the economic efficiency of expenditures on higher education and the distributional equity of the public support for higher education are surely prominent. After a brief analysis of the economic efficiency issue, this paper turned to its primary objective, an empirical investigation of the distributional effects of public higher education in our most populous state, California.

The general nature of the redistributive effects of the current method of financing public higher education in California is clear. Some low-income persons have benefitted handsomely from the availability of publicly-subsidized higher education. But on the whole, the effect of these subsidies is to promote greater rather than less inequality among people of various social and economic backgrounds, by making available substantial subsidies that lower income families are either not eligible for or cannot make use of because of other conditions and constraints associated with their income position.

To overcome the effects of the present system would require a substantial overhaul of the pricing system in public higher education, a realignment of the tax structure, and/or a broadening of the eligibility base for public expenditure programs. With respect to the latter alternative, eligibility for public subsidies to young people might well be expanded so as to embrace all young people—not only those who go on to college but also those who opt for alternative ways of expanding their earning power, such as apprenticeship or on-the-job training, or even investments in businesses. In any case, it is clear that whatever the degree to which our current higher education programs are rooted in the search for equality of opportunity, the results still leave much to be desired.

Criteria for Public Investment in Higher Education

Neil Singer and *Paul Feldman*[*]

INTRODUCTION

In a report to the President published in January, 1969,[1] the Secretary of Health, Education, and Welfare applauded the outgoing administration for having "looked squarely at the needs of education and acted boldly to meet them". He went on to point out that "[T]he 1960's have seen an unprecedented increase in the Federal commitment to higher education—from $2.5 billion in 1963 to almost $6 billion in 1968." The report concludes with a recommendation that by 1976, Federal aid to higher education should reach a level of almost $15 billion. In a remarkably candid passage in the opening section, the report notes that "[T]he Federal government has never developed an explicit strategy for the support of higher education. Although Federal involvement is large . . . no real attempt has been made to define an appropriate role for the Federal government in the financing of higher education." This combination of rapidly growing expenditures and an inadequately defined role for government is by now a familiar problem for both budget analysts and the taxpaying public.

The proposals presented in the H.E.W. report seem unexceptionable at first glance: increase the number and proportion of educated people and raise the quality of higher education, all the while maintaining diversity and promoting efficiency. Unfortunately, no further refinement of these goals is suggested. Vague statements of desired conditions such as the above offer no precise measure of the worth to taxpayers of increased quality, diversity, attendance, or academic freedom. Nor is it evident why the government, as opposed to private individuals, should be asked to pay at all for higher education but not for shirts, cars, or color television sets.

A projected fifteen billion dollar federal subsidy to higher education deserves more serious discussion than has been provided in the H.E.W. report. What is particularly important is that the underlying reasons for federal action be determined, and that criteria be established to evaluate proposed public policies. This paper presents a discussion of the economic bases for government policy in the field of higher education. It will show how the specific definition of problems and the establishment of criteria for public investment in higher education can be used to design a strategy for future spending.

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[1] U.S. Department of Health, Education, and Welfare, *Toward a Long Range Plan for Federal Financial Support for Higher Education*, January, 1969.

I. HIGHER EDUCATION AS A PRIVATE INVESTMENT

There is little doubt that "human capital" provides one of the most productive investment opportunities in the American economy. Economists frequently measure the attractiveness of an investment by its rate of return, the interest rate which equates the cost of the investment with the value of its future returns. A rate of return higher than the market rate then means that the particular investment will yield greater future income than if the same amount of capital had been invested at the market rate of interest. Numerous studies have shown that if the return to education is measured as the dollar income gained by the student investment in human capital is much more productive than most other allocations of capital. On the average, education through the eighth grade may yield a 29 percent rate of return,[2] a high school diploma offers returns of 15–20 percent to the student,[3] and a baccalaureate degree earns 12–15 percent.[4] Even graduate degrees in Arts and Sciences, which usually equip students for relatively low-paying teaching jobs, yield rates of return of 5–11 percent.[5] Demands for increasingly skilled labor make it unlikely that this pattern of rates of return will be altered in the near future.

The mere existence of an attractive investment opportunity does not, however, provide a justification for the investment to be undertaken publicly. A concept central to a free enterprise economy is that each person is the best judge of how to allocate his own resources: what goods to consume, how much of his income to save, and what types of investments—differing as to risk and rate of return—to undertake. If markets function perfectly, these judgments will lead individuals to a maximum level of well-being. It is an important conclusion of economic theory, however, that the choices which individuals make freely will *not* lead society to its highest level of well-being if the functioning of the market is impaired. Some of the types of market failure which can be observed are caused by:

- monopoly elements in either supply or demand;
- restrictions on the movement of resources or products between markets;
- lack of information or knowledge of market opportunities by producers or consumers;
- external costs or benefits, such that the allocation decisions of individuals ignore costs or benefits accruing to other economic units.

We will argue that only when market imperfections such as these can be found can a case be made for government intervention to alter the free choice of individuals. Furthermore, it will be argued that the appropriate government action depends upon which imperfection is in fact present, and therefore, the first analytic step in determining the proper scope of government activity should be to search for evidence that markets are failing to operate properly.

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[2] W. L. Hansen, "Total and Private Rates of Return to Investment in Schooling," *Journal of Political Economy*, LXXI, April, 1963, pp. 128–40.

[3] *Ibid.*

[4] G. Becker, *Human Capital* (New York: National Bureau of Economic Research, 1964).

[5] O. Ashenfelter and J. Mooney, "Some Evidence on the Private Returns to Graduate Education," *Southern Economic Journal*, XXXV, January, 1969, pp. 247–56.

To discover such evidence is not a trivial matter, since the evidence can be conclusive only if it is supported by careful and rigorous analysis. For example, it is sometimes argued that an unusually high rate of return to a productive activity is evidence that the industry in question is monopolized or that production within the industry is limited by restrictions on capital flows to potential entrants or firms wishing to expand. But a high rate of return in itself cannot be considered proof of market failure. Investment in that industry may be so unattractive on other grounds that the unusually high pay-offs are required to attract investors. There may, in fact, be no market imperfection at all. In the discussion which follows, problems of market imperfections specific to higher education will be considered, and criteria for assessing public investment in higher education will be proposed.

II. RATE OF RETURN DIFFERENTIALS AND PRIVATE INVESTMENT IN HIGHER EDUCATION

The high rate of return to education has often been considered an indication of underinvestment by the market and, therefore, reason for government intervention. But does the high rate of return in itself justify public subsidies to college and university students? If a disparity in rates of return indicated the presence of market imperfections, then the marked differences among rates of return to different amounts of education, and between education and other investments, would be a strong argument for government intervention. There is, however, a substantial reason, that of risk, why differentials among rates of return may be quite consistent with perfectly functioning markets and rational resource allocation by investors.

There are several aspects to the question or risk. Investors (lenders) are concerned not only with mathematical expectations of returns, but also with the range of possible outcomes. An investor usually will prefer an investment with a small range of possible returns to one with a larger range if the expected return is the same in both cases. In other words, he may be indifferent between two investments if one has both a higher expected yield and a wider range of possible yields than the other. If higher education is a risky investment in the sense of offering a wide range of possible rates of return, a rational investor would demand a higher expected rate of return on investments in (risky) human capital than in other, safer investments. The rates of return estimated in the studies cited above are, of course, expected returns. We should not conclude that educational underinvestment exists unless the returns to other, equally risky investments are significantly lower than the returns to education. Becker[6] points out that the *net* rate of return to education over (similarly risky) corporate investments is of the order of the magnitude of 5 percent, rather than the 10+ percent differential over riskless assets (which yield 5 percent or less). Once risk is considered, therefore, the argument that there is underinvestment in higher education becomes muted. The typical lender must evaluate an investment with a long deferral of repayment, low collateral, and substantial uncertainty about the borrower's ability to repay. It is hardly surprising that most lenders prefer not to invest to the point at which the expected return is 5 or 6 percent.

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[6] *Op. cit.*, p. 115.

Borrowers may also be subject to risk aversion. One of the arguments for subsidized medical education is that students are unwilling to mortgage their future incomes to the extent required to complete medical school, residency, public service, and the lean years that frequently accompany a new practice. Statistics amply demonstrate the high rate of return to medical training, but the possibility of facing a large debt and a low income may deter some students from becoming doctors. More generally, any student may prefer not to encumber himself with a heavy debt that he is unsure of being able to repay.

There are several reasons to believe that higher education will, in fact, be a risky investment. One reason is that there are differences in the abilities of students to profit from additional education. Becker[7] concludes that most of the net return to college education is *not* due to the higher abilities of college students: rather, "college education itself would be the major determinant of the apparently high return associated with education".[8] Nonetheless, 10–20 percent (perhaps as much as two percentage points of the net return on investment) of the net return to higher education appears to be due to differentials in the aptitude of students who choose to go on to college. This conclusion is supported by another study,[9] which estimated a very high (24–26 percent) average private rate of return to postsecondary technical education but found a "wide range in the rates of return to individual members" of the student group.

Since student ability is difficult to predict, the partial dependence of rates of return on individual ability increases the uncertainty that borrowers (students) and lenders must face in deciding whether to invest in higher education. Thus the riskiness of each investment is increased, and high returns to education may not provide sufficient incentives for individual borrowers or lenders.

Another reason for the riskiness of investments in higher education is differences in student motivation. Economic models usually assume that each economic unit attempts to maximize its income. A more basic maximand, however, is the welfare to which income contributes. If a student has a strong preference for leisure, his welfare can be maximized only at less than maximum income. Even if college students have free access to capital, they may prefer not to invest in education to the point at which the rate of return equals the market interest rate. The aesthete may prefer a life of privation even if a master's degree in mechanical engineering could enable him to earn a high income. Ashenfelter and Mooney[10] infer that academics in particular may prefer not to maximize income, and cite another conclusion that "professional attitudes . . . on the part of academics tend to be a compensatory substitute for monetary returns . . ." However satisfactory this behavior may seem to students, it certainly will reduce lenders' confidence in students' future ability to repay.

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[7] *Op. cit.*, p. 80.
[8] *Op. cit.*, p. 85.
[9] Carroll and Ihnen, "Costs and Returns for Two Years of Postsecondary Schooling: A Pilot Project," *Journal of Political Economy*, LXXXV, December, 1967.
[10] *Op. cit.*, p. 255 and fn.

An important extension of the preceding point is the student's like (or dislike) for the process of education. Returns to college and graduate education are very high; yet many qualified students simply get tired of going to school. While the rate of return to education may exceed the market interest rate even at high levels of educational attainment, there is some evidence that the psychic, or non-money, cost of education also rises. Thus, the student's decision to "drop out" may represent a perfectly rational allocation of his own resources.[11] High rates of return to education are related to these psychic costs in two ways. First is that high monetary returns may be insufficient to offset the real (though non-money) costs which students incur. Second, the possibility of "dropping out" deters both students and lenders from investing in higher education by increasing the riskiness of individual investments.

III. RATE OF RETURN DIFFERENTIALS AND PUBLIC SUBSIDIES TO HIGHER EDUCATION

The factors mentioned in the preceding section show that differentials among money rates of return to higher education and other investment opportunities need not imply that market imperfections are leading to underinvestment in higher education. The rate of return to investment in higher education (net of differences in aptitude) appears to be only 3–5 percent higher than in corporate manufacturing investments (which may well be less risky). Nonetheless, there are many instances in which the expected private monetary rate of return to higher education exceeds the market interest rate, offering the prospect to the government of raising total money income by subsidizing higher education in these cases. It should be clearly recognized that as long as markets are functioning properly, government subsidies *even in these cases* will not result in an increase in *real* national income and hence are *not* justified by their net benefits to society.

Subsidies to students will increase investment in higher education by lowering the costs of investment and increasing the net rate of return. "Underinvestors" will then obtain more education, up to the point at which the total cost of education (including non-monetary costs) equals the money rate of return. At this point these former "underinvestors" will be somewhat better off than before they increased their education and income: the increase in their real income is measured by the total amount of the subsidies they receive, *less* the increase in the total cost (including the psychic cost of additional risk-taking) associated with the increase in the level of educational investment.

The subsidies, however, must be paid for with higher taxes (either directly or through public borrowing). The recipients of the subsidies cannot be made to pay for them out of the increase in their income, for any tax or higher interest rate will reduce the net return to (subsidized) higher education, and the subsidy recipients will prefer to forgo the subsidies rather than to undertake the additional investment. The full amount of the subsidies must therefore be paid by nonrecipients, whose incomes must fall by the full amount of the subsidies. The increased real income of recipients represents a transfer of wealth from the taxpayers to students, but a transfer which increases students' real incomes by less than the cost to taxpayers. Thus, this attempt to increase the level of investment in education must actually *reduce* total real wealth, as well as require that some people be made absolutely worse off in order to make others better off.

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[11] **This point is also made by Becker (*op. cit.*, pp. 121–22).**

This analysis rests on the assumptions that no impediments prevent the efficient allocation of investment in higher education and that income redistribution through grants of education is not a policy objective in itself. In the next section these assumptions are relaxed, and the implications are examined for public policy toward the level of investment in higher education.

IV. IMPERFECT MARKETS AND GOVERNMENT INVESTMENT IN EDUCATION

A. Monopoly Elements

The first of the four types of market imperfections cited earlier is the presence of monopoly elements in either the demand for or supply of education. Monopoly in demand is obviously improbable, due to the large number of highly competitive students. Monopoly in supply is likely to occur primarily in professional education, where the licensing procedures of professional societies (in law, medicine, accounting, etc.) enable them to restrict the number of newly-trained students. Even in this case, monopoly in education is somewhat different from other types of monopoly, but the appropriate public response is similar: to eliminate the artificial restriction of supply by traditional anti-trust activities. Subsidies to students are not appropriate since professional schools suffer less from a shortage of funds than from the limitations of accreditation. Nor will subsidies to new professional schools correct the basic problem of restrictive licensing organizations.

B. Imperfect Capital Markets

Malfunctioning capital markets may offer a second justification for government intervention. As noted in the discussion of risk above, lending institutions may apply capital-rationing rules to allocate investible funds among potential borrowers. Such rules usually favor the larger corporate borrower, and frequently prevent small businesses from borrowing at any interest rate. As Becker points out,[12] these rules will apply most stringently to students, who seek to borrow for risky investments with little or no collateral.

Capital rationing may also discriminate against blacks. There is a growing list of examples of the unwillingness of mortgage, lending, and bonding institutions to underwrite black business ventures, despite the good prospects for success of many black businessmen. Ample evidence exists that black students have historically earned lower incomes (rates of return) than whites, and it seems likely that the attitudes of lenders toward black students, as toward black businessmen, reflect past economic discrimination rather than the more favorable economic outlook for black today.

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[12] *Op. cit.*, p. 58.

If lending institutions do exaggerate the riskiness of investments in human capital or otherwise discriminate against this type of investment, the appropriate public policy response is simply to make capital available to interested students at an interest rate *which includes the proper risk premium*. Federal loans at 2 or 3 percent, no less than outright grants, would represent subsidies to college and graduate students. The case for such subsidies may rest upon a desire to redistribute income, but these subsidies cannot be justified by the existence of capital-market imperfections or by the non-maximizing behavior of lenders and borrowers.

The Federal Government does, of course, engage in activities to increase the availability of capital to particular groups of investors such as small businessmen and homeowners. The National Defense Education Act authorized the federal government to extend capital to colleges and universities for the purpose of making loans to students. In addition, the U.S. Office of Education has underwritten direct private loans to students. Unfortunately, the latter program has been ineffective during the current "tight money" episode, and it is possible that colleges and universities may incur added costs if the demand for higher education exhibits cyclical fluctuations.

C. LIMITATIONS ON INFORMATION

The third market imperfection is the possibility that investors (students and lending institutions) may not have sufficient information about the returns to educational investment. Ignorance on this subject would not be surprising, since economists are only now beginning to reach a consensus on the average returns to broad groups of students, such as white and non-white males and females. More detailed estimates of returns, classified by field of study, region, desired occupation, and ability, are needed to enable individual students to forecast their own likely rates of return. Labor market discrimination against females and blacks is known to reduce these groups' rates of return, but estimates of the relation between their education and future income are still very imprecise. As suggested above, borrowers' and lenders' estimates of returns to higher education may overstate the effects of discrimination by race and sex. Even in the absence of other imperfections, therefore, incomplete information may convince some students not to undertake educational investments which probably would yield high returns.

The proper policy response to imperfect information is, naturally to increase the amount of information available for decision-making. If the information shortage results in under-estimates of the returns to education, the federal government should undertake and support studies to provide better estimates, and these studies and their conclusions should be publicized among the affected groups. (Due to the public-goods nature of such research, it is doubtful if state or local governments or private institutions will offer to support the appropriate amount of research.)

This policy will necessarily entail a redistribution of income, since it is not feasible to tax only those students who profit from the additional information provided. The income redistribution is part of the cost of increased information which must be weighed against the benefits, i.e., the increased incomes of some students. The rest of the cost is the aggregate increase in taxes needed to finance the studies. At the least, the realized increase in students' incomes should exceed the resource cost of the studies if the policies are to be pursued, and at best, those whose incomes increase should pay for the studies. In general, the redistribution of income should be clearly set forth in order to provide a basis for judging the desirability of the policies.

D. External Benefits

The fourth type of imperfection which may lead to underinvestment in education is the existence of benefits which accrue to society in addition to those accruing to the educated individual. A perfectly rational investment decision by the individual involves calculation of the costs and benefits to himself alone. But if other members of society benefit from an increase in the student's investment in education, they can induce him to undertake additional investment by offering a subsidy. The subsidy should correspond to the value that society, *exclusive of the student*, derives from the incremental investment in education.

It seems clear that education, at least up to minimal levels, confers external benefits upon the rest of society in the form of reduced crime and delinquency rates and lower demands for welfare transfers to the undereducated (who frequently are unemployed). Increments of these types of benefits appear to decrease as higher and higher levels of education are attained. Nonetheless, other types of external benefits probably will be generated as educational levels rise. Among these are the improvements in the public decision-making and resource allocation which result from more efficient functioning of democratic processes. In addition, increases in labor productivity resulting from higher educational attainment may cause the productivity of other factors of production to increase, although markets are not generally capable of reflecting such technological externalities. The evaluation of externalities such as these is extraordinarily complex, since the recipients of the benefits are determined by the play of thousands of individual decisions.

Whether or not these benefits exist and are significant at the college level, arguments for public support of investment in higher education have generally not been based on these factors. Instead, the emphasis in most public policy proposals has been upon the rate of return to the individual, and subsidies have come to be viewed as a means of transferring wealth to the poor. It is important to measure the amount of external benefit generated by higher education, for subsidies to support further investment in education should be offered on the basis of these externalities. But lack of serious effort to measure these benefits by proponents of public subsidies to higher education suggests that the magnitude of external benefits is not likely to provide much basis for government subsidies.

Even though imperfections in markets directly affecting levels of investment in education may provide no basis for subsidies from the government, subsidies for education are often advocated as a means of redistributing income to the poor. The desirability of redistributing income, and the appropriate methods of achieving a desired redistribution are among the thorniest questions addressed in debates over public policy. It has been argued elsewhere[13] that income redistribution by government is an activity which taxpayers support because of the external benefits they receive. Accordingly, the method of redistribution as well as the amount should conform to taxpayers' preferences. If taxpayers are interested solely in increasing the level of satisfaction of the poor, or if taxpayers are concerned only that low levels of income prevent poor people from achieving minimal consumption levels, direct transfers of current wealth are likely to be the most efficient method.[14] Conversely, if taxpayers are willing to increase low-income individuals' wealth, but do not wish to subsidize their current consumption, then subsidies to education may be the preferred method of transfer. The question of whether or not to subsidize education as a means of transferring income can only be decided after it is determined whether taxpayers desire to transfer income directly or through some intermediate process.

If indirect transfers are desired, a grant of education can be expected to increase the recipient's future income more than most other types of once-and-for-all subsidies. There are, however, several caveats to this policy.

(1) The income-producing effect of education depends heavily on the workings of the market. If discrimination is prevalent, for example, the returns to educating black students will be less—perhaps much less—than the average returns.

(2) Earlier in this paper the possible existence of psychic costs was advanced to explain high rates of return to education. Because low-income black students frequently receive inferior elementary and secondary education, and often feel (even if incorrectly) that traditional education is "irrelevant" to the problems faced by blacks in a white society, the psychic cost of education may be higher for black students than for whites and the rate of return lower. Similar arguments may limit the benefits which other disadvantaged groups derive from education. For example, low-income students may have high subjective discount rates due to an inability to plan for the future,[15] and thus will place a lower value on future income than will higher-income students. Policies designed to provide higher education to these groups will then increase their incomes by less than policy-makers expect.

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[13] See P. Feldman, ***Efficiency, Distribution, and the Role of Government in a Market Economy,*** IDA Research Paper No. 477 and E. O. Olsen, "A Normative Theory of Transfers," *Public Choice,* VI, Spring 1969, p. 39.

[14] **Direct transfers are assumed to have no secondary effects u[illegible] self-esteem or incentives to work. If these effects lead potential recipients to [illegible] transfers, some indirect transfer may be preferable in order to maximize the i[illegible]ients' current incomes.**

[15] **H. P. Miller, "Lifetime Income and Economic Growth,"** ***American Economic Review,*** **LV, September, 1955, p. 835 fn.**

The advantages of education as opposed to direct transfers of income thus become less apparent.

(3) The nature and extent of the redistributon of income must be clearly identified. Several types of indirect subsidies now provide higher education for students from middle- and upper-income families. Federal research support of private institutions permits the charging of fees which are below average cost, though above the means of low-income families. The tax advantages of charitable support of these colleges and universities produce the same effect by increasing their endowments. Another indirect subsidy results from the fact that because they receive superior elementary educations, students at state universities typically come from middle-income homes. Yet the incidence of taxes which support these state universities is probably regressive, and at most proportional, and thus the overall incidence of taxes and benefits of public university instruction is clearly in favor of middle-income students

(4) Encouraging students to invest in higher education by making the expense tax-deductible is certain to offer an additional subsidy to middle- and upper-income students. The cost of education will be reduced more for wealthier families, and since income increases with the amount of education, the subsidy will increase the inequality in the future distribution of income. Moreover, the cost of subsidies, (deductions) will have to be financed by taxpayers at large. The result will be a marked redistribution of income from the poor to the rich.

Redistributing income through grants of education will be an effective policy when the recipients underinvest because of incorrect information about the returns to education, or if individuals' rates of discounting the future must be subordinated to a lower public discount rate (for some noneconomic reason). Other social effects, such as the impact of higher educational attainment upon the size of public welfare rolls, are likely to diminish in importance as educational level rises. The conclusion of this part of the discussion, therefore, is that attempts to redistribute income through subsidies to higher education may be effective, but that historically the redistribution usually has increased income inequality and may not work to reduce it due to the characteristics of different groups of recipients.

V. SUMMARY AND RECOMMENDATIONS

Despite the high rates of return to education calculated by many economists, public support of higher education may not be justified. In equilibrium, rates of return in excess of the market interest rate may result from: (1) risk aversion on the part of the students and lending institutions, (2) goals of students other than income maximization, (3) non-monetary costs of education, or (4) differences among students' aptitudes. If these factors are the root cause of persistently high returns to education, public programs which increase the level of educational attainment may actually *reduce* real national income.

If the markets in which individuals determine the extent of their educational investment do not function properly, it may be necessary for the government to intervene. Among the bases for intervention are improper allocation of investible funds, lack of information on the part of students, the existence of external benefits, or a social desire to alter the distribution of income. However, the policy response to market imperfections should be to remove the imperfection, and the criteria for evaluating government programs should be the success achieved in eliminating the imperfections. It is unlikely that general public support of higher education will improve the allocation of resources. Programs which provide higher education to specific (low income) groups may be justified, but general public subsidies to higher education have usually increased the degree of inequality in the distribution of income.

"Equity" Versus "Efficiency" in Higher Education

David Segal*

INTRODUCTION

Whether a nation's best interests lie with universal higher education, or with the concentration of educational resources on the highest ability groups, is a compelling question for most developed countries. It is also a question which historically has been fogged up by ideological considerations. American emphasis first on meritocracy and more recently on egalitarianism has called forth large and comprehensive arrangements for higher education. By contrast, the countries of Western Europe have traditionally defended smaller hierarchical or "caste" systems. Even European attitudes seem to be changing. The Robbins Report on British higher education, as an example, demands that Britain make a sharp break with past policies:

> We have [no] doubt of the value to the country of a greatly increased stock of highly educated people and the absolute necessity of a great increase in the present provision of places in higher education if this country is to hold its own in the modern world.[1]

The urgency of the Robbins Report recommendations is seen in the fact that only one student in eight with a General Certificate of Education continues with higher education, as compared with a ratio of about one high school graduate in two in the United States.[2]

Despite the marked differences in the rate of college attendance in Britain and the United States, underlying economic influences are similar. The Robbins Report found that "clearly the economic circumstances of the home are very influential in determining who goes to college."[3] In the United States, of the approximately seven million students who go on to college about half come from families in the upper quarter income bracket. These realities give rise to de facto segregation in higher education by income class, making the American educational system—despite its underlying philosophy of egalitarianism—different from the British only by degree.

The purpose here is to remove the discussion of higher education policy from its ideological and sometimes even nationalistic undertones, and to look at the problem afresh in terms of the economics of resource allocation. The basic question is whether a government with limited budgetary resources to spend in support of higher education is better off trying to get larger percentages of high school graduates into college, or whether an optimal course would emphasize subsidy only for the more able students. These two options are not mutually exclusive, so the presentation here is in terms of the direction or emphasis of policy. In the first section we shall also look at the effectiveness of public institutions of higher education in reducing inequities.

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[1] "Higher Education," Report of the Committee appointed by the Prime Minister under the Chairmanship of Lord Robbins, 1961–63, (HMSO, London, October 1963), Cmnd. 2154, p. 48.

[2] The U.S. ratio masks considerable variation in attendance ratios for the different states. At one extreme, California's multi-tiered system, according to the *Wall Street Journal* of June 25, 1969, ("A Crunch Is Coming in Higher Education" by Thomas J. Bray) absorbs more than 80% of each graduating high school class. Similarly, state-supported schools in Ohio and elsewhere are required to accept all high school graduates.

[3] *Op. cit.*, p. 51.

A second section raises the possibility that investment in some groups, such as those with higher ability, may be socially more productive, and hence more efficient in terms of the use of public funds. A final section examines some of the short and long term implications of alternative policies.

EQUITY IN HIGHER EDUCATION

By "equity" in higher education we refer to the absence of financial barriers to undergraduate education. "Inequity," conversely, suggests the presence of people who qualify to enter college and who would go but for lack of funds. A policy promoting greater equity is one which increases the percentage of college attendance from low income families.

Equity in recent years has been associated with equality of educational opportunity.[4] This was not always the case. During the fifties and before, discussions of this subject was set forth in terms of tastes and preferences for higher education. Perfect capital markets for financing educational investment or perfect part-time job markets were assumed. If a high-school graduate chose not to go to college his decision derived from improper motivation. Today, perhaps because of increased social and economic pressure to attend college, those who come from low-income families and who fail to go on after high school are given the benefit of the doubt. They are victims of inadequate opportunity for higher education.

Empirical evidence tends to support a close relationship between family income and who goes to college. During the 1960's a number of surveys have been conducted which report, among other things, family incomes. Project Talent,[5] the American College Testing Program,[6] the American Council on Education,[7] and the Bureau of the Census[8] have each collected information from a cross-section of undergraduates, in different years. The surveys, which have a variety of unrelated purposes, were conducted independently of one another. With the exception of Project Talent, each of the surveys asked respondents to note on the questionnaire the income class appropriate for his family. The surveys varied this question both as to the number of income intervals (ranging from four to nine) and as to the size and limits of the intervals. The designers of Project Talent felt that the respondents could not be relied upon to provide good estimates of their families' incomes, and accordingly an index of socioeconomic environment was computed. The questionnaire sought information not only on income but also on value of the student's home, books in-home, appliances, own room, father's occupation and education, and so forth.

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[4] Equality of opportunity here is used in a different sense from that in the Coleman report (James S. Coleman, U.S. Dept. of H.E.W., "Equality of Educational Opportunity," OE 38001, 1968). Coleman and others concerned with primary and secondary school education have observed criteria such as the absence of racial segregation, equal control over resources, and so forth. Here, equality of opportunity hinges on whether a college-age youth goes to college or not. As is indicated in the text, we assume that the decision not to attend college is related primarily to inadequate funds and not improper motivation.

[5] Project TALENT One-Year Follow-up Studies, Cooperative Research Project Number 2333, John C. Flanagan, Responsible Investigator and William W. Cooley, Project Director, Pittsburgh, University of Pittsburgh (School of Education), 1966. Pages 92–96.

[6] Baird, Leonard L., "Family Income and the Characteristics of College-Bound Students," *ACT Research Reports*, February, 1967, No. 17. Published by Research and Development Division, American College Testing Program, Post Office Box 168, Iowa City, Iowa, 52240.

[7] Creager, John A., Alexander W. Astin, Robert F. Boruch, and Alan E. Bayer. "National Norms for Entering College Freshmen—Fall 1968," *ACE Research Reports*, Vol. 3, No. 1, 1968. Office of Research, American Council on Education, Washington, D.C. Two earlier surveys by ACE, in 1966 and 1967, reported family income information. As in the case of the Census Bureau surveys (1966 and 1968) the surveys were conducted too close to one another in time for significant decreases in educational opportunity to be discernible. Only the most recent ACE survey is reported here.

[8] U.S. Department of Commerce, Bureau of the Census, unpublished data.

In addition, the Bureau of the Census in 1966 constructed a percentage distribution of incomes of families with college-age dependent children (ages 18 through 24).[9] This distribution differed from the percentage distribution of income of all families in 1966 in that the percentages of low income families were smaller and high income families greater. A plausible explanation for this discrepancy is the parents' age differences in the two sets of circumstances. That is, families with college-age children are a biased sample of the population of families at large, overrepresenting the numbers of middle-aged parents. These families, in turn, are close to their peak income potentials.

In order to eliminate the "age-income" bias from the percentage distributions of all family incomes for each of the years under study, we corrected the family income distribution data using the set of constants implicit in the 1966 data. In this manner we estimated a set of percentage distributions of incomes of families with college-age youth with which to compare the results of each of the surveys cited above. We were thus able to compare the percentage of undergraduates in each income category with the percentage (estimated) in that category of all families with college-age dependents.

These two sets of data enabled us to construct sets of Lorenz diagrams showing the distribution of undergraduate educational opportunity. The Lorenz curve showing the results of the American Council of Education (ACE) survey of 1967 is shown in Figure 1a. Cumulative percentages (ranging from 0 to 100) of all college-age youth ranked by family income (lowest to highest) are represented along the horizontal axis. The diagonal line represents a hypothetical distribution of college students indicating full equality of educational opportunity. That is, equal percentages of students come from the poorest and richest quartiles of college-age youth. Note that the diagonal distribution does not require that all college-age youth in various income classes go to college. In fact it is consistent with a pattern in which only one percent of the college-age youth in each income cateogry enter college. The diagonal simply requires that there be no systematic exclusion of youth from college on the basis of family income. In other words the diagonal represents a distribution of college students exactly proportionate to the distribution of college-age youth.

The actual distribution of college students found in the ACE survey is represented by the curve beneath the diagonal. One of the points on this curve indicates that poorest third of college-age youth (X-axis

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[9] U.S. Department of Commerce, Bureau of the Census, unpublished data.

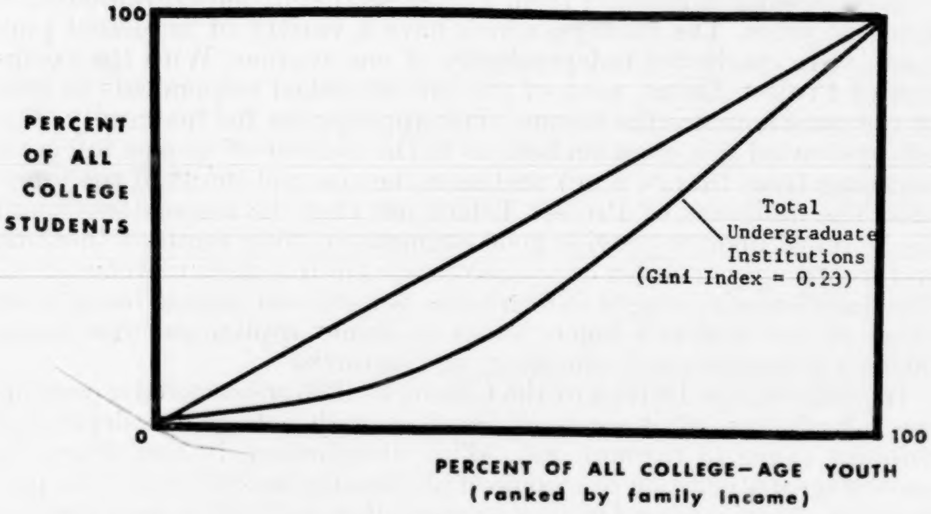

FIGURE 1a

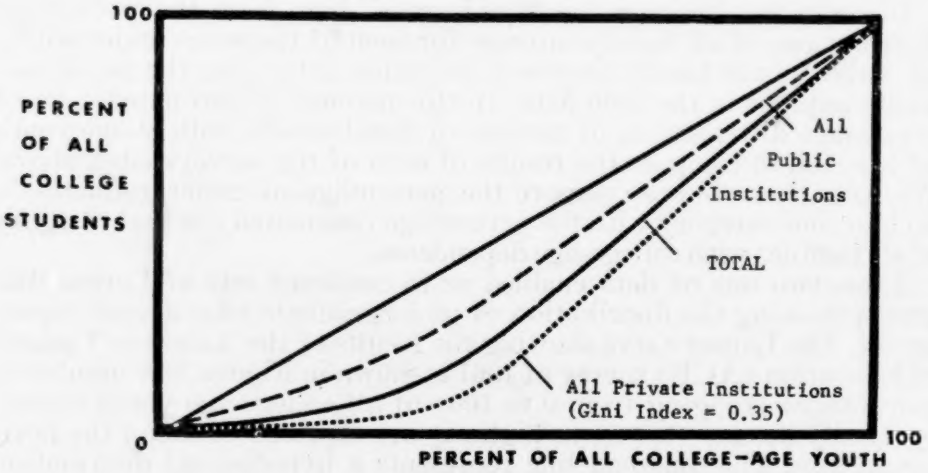

FIGURE 1b

coordinate of 31.3%) contributes numbers amounting to only one-sixth of all college students (Y-axis coordinate of 16.6%).

The curve beneath the diagonal in Figure 1a represents the income segregation of college opportunity for all students attending four-year colleges, whether the colleges are public or private institutions. If public and private nonsectarian colleges are looked at in isolation, we find a substantially higher degree of income segregation in the private institutions and a considerably lower degree of disparity in the public institutions.[10] This is depicted in Figure 1b. It is interesting to note that despite the egalitarian philosophy of the land grant colleges, their student bodies tend slightly to overrepresent youth from higher income families.

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[10] The income-segregation picture for Negro students may be the reverse of the nationwide trend. Figures of the Southern Educational Reporting Service appearing in the *Wall Street Journal* of June 25, 1969, show that Negroes account for three to four percent of the student bodies at traditionally white colleges, but for less than two percent at state universities.

One way of summarizing the information in the Lorenz curves depicted here is through the Gini index. This measure is defined as the area between the "opportunity" cure and the diagonal, as a fraction of the entire area under the diagonal. The Gini index thus falls within the range of zero to one. The higher this index the greater the inequality of opportunity. The Gini indexes for the three ACE curves in Figure 1b are, for all four-year colleges, 0.23; for private-nonsectarian colleges, 0.35; and for public colleges, 0.12. The Gini indexes for the other surveys were computed and have been recorded in Table 1.[11]

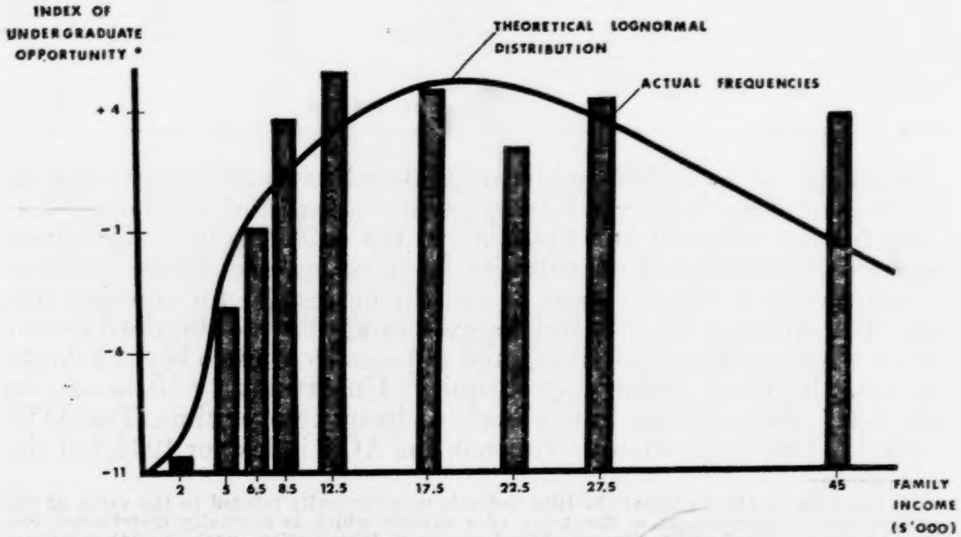
While the Lorenz curve can be a valuable tool for making cross-sections or time series comparisons, the Gini index has some major shortcomings. Its principal deficiency is that it is a descriptive number which has no real theoretical basis. For example one possible explanation for a decrease over time in the Gini index for undergraduate educational opportunity is that fewer rich people and fewer poor people with the passage of time send their children to college. In the analysis here such a conclusion would be highly implausible. Yet there is no theoretical dimension to the Gini index which allows us to evaluate different hypotheses.

An alternative approach might be to assume that the distribution of higher educational opportunity, like the distribution of incomes, is described by the lognormal density function. Educational opportunity, under these circumstances, is defined for a given family income cate-

FIGURE 2

DISTRIBUTION OF UNDERGRADUATE OPPORTUNITY

(ACE SURVEY - 1967)



*DIFFERENCE BETWEEN % COLLEGE STUDENTS AND % COLLEGE-AGE YOUTH gory as the difference between the percentage of college students and the percentage of college-age youth. The density function for undergraduate educational opportunity described by the ACE data for all college students is shown in Figure 2. If we assume the distribution of educational opportunity is lognormal, then by converting the X-axis from a natural to a logarithmic scale the distribution becomes normal. Two parameters, the mean and the variance (or standard deviation) then fully describe the distribution. Changes in the mean reflect changes in the income level of families with college-age children, and hence changes in the level of educational opportunity. Changes in the standard deviation affect the disproportion between the distribution of college age youth and the distribution of college students. A decrease in the standard deviation, all other things equal, will diminish the disparity in educational opportunity. Conversely for an increase in the standard deviation.

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[11] The "Gini index" was computed according to the formula presented in "Trends in the Income of Families and Persons in the United States, 1947–1964," Technical Paper No. 17, U.S. Bureau of the Census, August 1967, pp. 34–36.

Table 1 summarizes the findings of the different surveys, according to Gini index, mean income, standard deviation. The density functions describing the different surveys of educational opportunity (Talent, ACT, Census and ACE) showed a reasonable closeness of fit to the lognormal distribution. If the fit were perfect one could expect a close statistical relationship between the Gini index and the standard deviation.[12] The absence of a parallel movement in the two indicators here as between samples should be ascribed to errors in approximating the lognormal density function.

TABLE 1.—*Parameter estimates for measures of inequality of undergraduate education opportunity various surveys*

Year	Survey	Gini index	Mean income	Standard deviation
1960	Talent	0.217		
1964	ACT	.246	$7,935	$430
1966	Census	.269	10,410	452
1968	do	.269	10,500	427
1967	ACE (total).	.299	9,965	522
1967	ACE (private).	.353		
1967	ACE (public).	.124		

What can be said about undergraduate educational opportunity on the basis of these findings? First the Gini indexes and standard deviations for the different surveys confirm the existence of a significant degree of inequality of opportunity based on income. Large numbers of college age students appear to fail the means test for entering college. The closeness of the Gini indexes (and also the standard deviations) to one another is striking and appears to confirm beyond doubt the magnitude of underlying inequity. Unfortunately little can be concluded about change in the levels of inequity over time. The ACE index for 1967 is shown as lower than the ACT index for 1964, but the

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[12] It has been established that the Gini index is monotonically related to the value of the variance and is independent of the mean of a sample which is normally distributed. See John Aitchison and J. A. A. Brown, *The Lognormal Distribution*, with special reference to its uses in economics, University of Cambridge Department of Applied Economics, Monograph No. 5, 1963, pp. 112–113.

Census indexes for 1966 and 1968 are identical, and in any case higher than either the ACT or ACE indexes. Thus errors of measurement and variability of survey technique conceal any decrease in inequality of educational opportunity that may actually have taken place during the early sixties.

On the basis of our analysis there would appear to be two courses for reducing disparities in opportunity for undergraduate education, a policy of subsidy and a policy of increasing incomes at the lower end of the income distribution. It is not the purpose here to advocate one particular form of subsidy over another. The inventory of forms is long and includes scholarships, fellowships, a broader loan market with lower loan costs, "forgivable" loans, Upward Bound programs, provision of college substitutes such as community and technical institutions, and lowering entrance requirements, as in the recent Rutgers and CCNY examples. To a degree, the Equal Opportunity Grants and Work Study Programs of the Johnson administration represented an attempt at subsidy. Available evidence tends to suggest that an incomes approach may not be as efficient as the subsidy. Galper and Dunn, in a recent study,[13] find a surprisingly low income elasticity of demand for higher education (0.69). They suggest that financing problems may determine the choice between a private and a public college, and influence only to a lesser extent the decision to attend or not to attend.

EFFICIENCY IN HIGHER EDUCATION

Efficiency here is used in the programming sense of maximizing the rate of return for a given investment. The question we ask is what are the implications of a government education policy which has as its aim maximizing the social rate of return for a given budgetary outlay.

Findings in the literature regarding the rate of return for different ability groups are somewhat ambiguous. Wolfle and Smith, in a follow-up study of a sample of Minnesota high-school graduates 20 years after graduation, show a pronounced difference in the rate of return for one or more college degrees for different ability groups.[14] This is revealed in the table below:

Median salaries of Minnesota men who had different post-high school education with intelligence scores held constant

	Education after high school graduation			
Intelligence-test score	None	Technical schools	Some college	1 college degree or more
Highest 20 percent	$4,000 (9)	$4,900 (15)	$5,300 (49)	$6,300 (171)
Next 35 percent	4,500 (33)	4,400 (55)	5,200 (107)	6,100 (197)
Bottom 45 percent	4,300 (57)	4,400 (106)	5,100 (159)	5,200 (191)

Note: The number of cases in each group is given in parentheses.

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[13] Galper, Harvey and Robert M. Dunn, "A Short-run Demand Function for Higher Education in the United States," forthcoming *The Journal of Political Economy*.

[14] Wolfle, Dael and Joseph G. Smith, "The Occupational Value of Education for Superior High-School Graduates," *Journal of Higher Education*, 27, (1956, pp. 201–212).

As can be seen from the table the impact of differential ability, both in absolute and percentage terms, is significant for after-high school education. This is true whether ability is measured by intelligence test scores, as shown here, or by percentile rank in high school graduating class, also reported in the findings of Wolfle and Smith.

Becker sidesteps the question of the rate of return on different ability groups per se. Rather he cites a number of different studies which correct for the influence of ability, to support his hypothesis that college education itself, and not the superior ability of those who go through college, explains most of the unadjusted earnings differential between college and high-school graduates.[15] One citation, a paper by Morgan and David, using regression analysis to eliminate influences on earnings other than education, found that measures of rank in school and ability to understand and answer questions were of negligible importance.[16]

A recent Ph. D. thesis for Yale University by Daniel Rogers supports the hypothesis that only small differences in the internal rate of return to college education are attributable to ability.[17] On the basis of a longitudinal study of 364 high-school graduates from three urban areas in Connecticut, Rogers finds that most of the increase in rate of return for college graduates with higher IQ's is offset by the greater earnings forgone during the college years.

Most recently, Weisbrod and Karpoff have investigated the returns from higher education for 7,000 American Telephone and Telegraph employees, with emphasis on the returns which are related to various "schooling" and "nonschooling" factors.[18] The former category includes the quantity of education, as well as the quality of the school, as judged by a telephone company personnel officer. "Non-schooling factors are intended to include ability, motivation and ambition, and are studied through the proxy variable, class-standing. The authors found that (1) precise class standing made little difference in earnings; (2) rough class standing made a statistically significant, although not a large difference; and (3) quality of schooling also made a difference, with higher earnings going to graduates of the better schools. The authors found that about one-fourth of the earnings differences were attributable not to differences in educational attainment, but to "non-schooling" factors.

In sum, a survey of recent literature on the relationship between ability and the private rate of return to a college education tends to diminish the force of the Wolfle and Smith findings. While undoubtedly the pay-off from a college education is larger for higher intelligence classes, ability and other "non-schooling" factors do not appear to make as much of a difference as education.

Several recent studies show that significant percentages from the highest intelligence groups of those with low socio-economic status have no college plans. On the basis of a cross-sections study of Wisconsin high-school graduates, Sewell and Shah found that only 33.6 percent of the males in the highest intelligence quartile of the lower-quartile parental income class had plans for college, while a full 28.4 percent of those in the lowest intelligence quartile of the top family income bracket planned to continue.[19] For females the figures were 26.1 percent and 30.2 percent, respectively. A recent study by the National Merit Scholarship Corporation found that while only a small percentage of National Merit Finalists could be classified as "needy," a significant fraction (24 percent) of those in the needy category who failed to obtain financial assistance never went on the college.[20] The study observed:

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[15] Becker, Gary S., *Human Capital,* a theoretical and empirical analysis, with special reference to education, National Bureau of Economic Research No. 80, New York, Columbia University Press, 1964, pp. 79–88.

[16] Morgan and David, "Education and Income," *Quarterly Journal of Economics,* Aug. '63.

[17] Rogers, Daniel C., "Private Rates of Return to Education in the U.S.: A Case Study," a Ph.D. Dissertation presented to Yale University, 1967, pp. 90–100.

[18] Weisbrod and Karpoff, "Monetary Returns to College Education, Student Ability, and College Quality," *Review of Economics and Statistics,* November 1968, pp. 491–497.

> while it is clear that the students receiving offers of financial assistance presented, on the average, superior academic credentials, the students not offered aid were still very talented. Almost one-fourth ranked in the top 2% of their high school class and their average SAT scores of 628.6 verbal and 636.9 mathematical exceed the entering freshman averages of many highly selective colleges.

Those who went on to college with scholarship aid tended to select private institutions, while those who were unable to obtain financial assistance tended to choose public institutions.

On the basis of the evidence which was cited in this section we may conclude that while ability may make a difference in expected earnings—and sometimes a significant difference—its importance has frequently been exaggerated. Even so, we find that significant percentages of able high school graduates appear to be left out of the higher educational system for financial reasons.

EQUITY VERSUS EFFICIENCY

Several points should be made in weighing the alternative emphases which higher education policy might take. First, as we have indicated, a number of recent works cast doubt on the magnitude of efficiency gains to be reaped from concentrating on the highest ability and intelligence groups. The burden of proof still rests with those who would argue that significant advantages may be had by subsidizing certain subgroups of the population to the exclusion of others.

Second, all evidence seems to indicate a strong connection between an individual's aspiration to college, his demonstrated level of ability, and his parent's educational status.[21] The children of college graduates appear to be better motivated for college than the offspring of those with lower educational status. This fact suggests an interesting relationship between short term equity and long term efficiency. Lateral gains in this generation in terms of broadening educational opportunity (lowering the Gini index and standard deviation) may produce efficiency gains in the next generation as better students enter college.

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[19] Sewell, William H. and Vimal P. Shah, "Socioeconomic Status, Intelligence, and the Attainment of Higher Education," *Sociology of Education*, 40 (1967, pp. 1–23).

[20] Crawford, Norman C. Jr., "Effects of Offers of Financial Assistance on College-Going Decisions of Talented Students with Limited Financial Means," National Merit Scholarship Corp. *Research Report*, 3 (1967, No. 5).

[21] A good bibliography of studies attesting to the close relationship between parental educational status and ambition for college is presented in William H. Sewell, Archie O. Haller, and Murray A. Straus, "Social Status and Educational and Occupational Aspiration," *Amer. Sociological Review*, 22 (February 1957).

A final point relates to the manpower needs of a service economy. In the past 15 years the share of total U.S. labor force employed in the service sector has increased from about 50 percent to about 60 percent. The rise in the service share is continuing. In practical terms we are creating significant excess demand for space scientists, engineers, laboratory and computer technicians and other skilled and professional personnel,[22] many of whom must have an undergraduate education among their minimum credentials. In short there is strong presumptive evidence to suggest that broadening educational opportunities may also have dividends in terms of easing some of the excess demands for skilled manpower, in an increasingly service-oriented economy.

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[22] A significant portion of this excess demand appears to be government induced. The salary increases of space scientists and engineers during the past decade seems in large part to reflect this point.

Higher Education Opportunity and Achievement in the United States

*Robert H. Berls**

I. INTRODUCTION

For any examination of equality of opportunity for higher education we need to know the socioeconomic characteristics of high school and college students. We need evidence about the income, occupation, and education of the parents of prospective college students, and the abilities of the students, before we can arrive at any understanding of equality of educational opportunity. We must have this understanding in order to determine the degree of equality of opportunity and to draw any conclusions about the appropriate numbers of scholarships or loans required, or to evaluate the social strategies of government and the implications of those strategies.

Social class and family income influences opinions, attitudes, health, style of life, as well as educational attainment, which in turn will influence social class and income. Race or ethnic group is another factor which influences all of these variables. But before we can say anything about who enters college we must know who finishes high school.

II. COMPLETION OF HIGH SCHOOL

Entrance to college is obviously affected by the high school dropout rate, and, as with every other level of educational attainment to be discussed in this paper, both ability and socioeconomic status (SES) play a decisive role in determining who will graduate from high school. For example, only 1.4 percent of students of high ability and high SES will fail to finish high school, but 29 percent of low ability and low SES students will drop out of high school. Students of high ability and low SES show only a 5.6 percent dropout rate, low to be sure, but four times greater than their high ability, but high SES, schoolmates. The numbers in the cells of Table 1 are the probabilities for dropout by SES and ability, and the numbers outside the cells represent dropout probabilities for the total SES and ability groups.

*** The author is on the staff of the Bureau of Higher Education, Office of Education, U.S. Department of Health, Education, and Welfare. The views presented in this paper do not necessarily represent the views or policies of the Office of Education or the Department of Health, Education, and Welfare.**

TABLE 1.—*Probability of failure to complete high school by SES and ability*

		Ability				
		High (1)	(2)	(3)	Low (4)	
SES	High (1)	1.4	2.9	6.8	13.5	3.2
	(2)	2.0	4.4	8.6	17.4	5.1
	(3)	3.2	5.7	11.9	21.6	10.4
	Low (4)	3.6	10.6	15.2	28.8	19.0
		2.3	6.0	12.5	25.2	

Source: Project Talent, followup survey of the 1960 10th grade high school students.

III. WHO GOES TO COLLEGE

College enrollments have grown enormously in the United States over the last 10 years. In 1958, only 3.2 million students were enrolled in college, but in 1968 enrollment has grown to 6.9 million, and 9.4 million students are projected by 1976.[1] But even though college enrollments have grown so rapidly, the proportion of high school graduates entering college has not changed significantly since 1880. At that year about half of all high school graduates entered college, and this rate was maintained to the mid-1920's when it declined to about 40 percent. By 1945 the rate of college entrance had returned to about half. The large recent increases in enrollment are more a function of population expansion rather than large proportional increases in college attendance by high school graduates.[2]

In 1965 there were 2.6 million students who graduated from secondary schools in the U.S. Of these, 35 percent or about 900,000 entered college in the year of high school graduation, and 46 percent or 1.2 million will have entered college within 5 years of high school graduation. About 75 percent of the 1965 graduates who will enter college (within 5 years of high school) did so in the year following graduation.[3]

Entrance to college is highly influenced by the income and other factors comprising the socioeconomic status of the parents of high school graduates. Figure I shows the probabilities, in graphic form, of entering college, full or part-time, within a year of high school graduation.[4] This bar chart distributes the probabilities of college entrance in quintiles of academic ability, and quartiles of SES. These five groups of bars represent the ability range of all high school graduates in that year. Each group of bars shows the distribution of the socioeconomic status of the students in that ability group. The highest probability of college attendance is about 82 percent for the high school graduates in the top ability quintile who also have the highest SES, whereas the graduates of equal ability, but low SES, have a probability of college entrance of only 37 percent, or less than half the likelihood of college entrance of the first group. This pattern remains true of each of the ability groups: the higher the SES the greater amount of college attendance even though ability is equal.

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[1] *Projections of Educational Statistics to 1976–77* (1967 Edition). U.S. Office of Education, Government Printing Office, Washington, Table 6.

[2] A. J. Jaffe and Walter Adams, "Trends in College Enrollment," *College Board Review*, Winter 1964–65, pp. 27–32. Jaffe and Adams believe that this proportion will not change for four-year colleges, but that the rapid increase in two-year colleges may increase the proportion of college entrance by high school graduates. Another long-term study of college enrollment trends, using a different method than the one employed by Jaffe and Adams, has come to similar conclusions. This analysis found that from 1919 to 1964 "There has been no trend in the ratio of enrollments in 4-year institutions to the eligible population . . . ." (Eligible population is the 18–24 year old age group who are high school graduates and are not in the armed services.) When enrollments in two-year colleges are included in these calculations then "a definite upward trend appears." Most of this upward trend has been since World War II, a period of expansion in two-year colleges. See Robert Campbell and Barry N. Siegel, "The Demand for Higher Education in the United States, 1919–1964," in *The American Economic Review*, June 1967, pp. 482–494.

[3] Unless otherwise indicated, all data in this report is unpublished data from Project Talent, five-year follow-up surveys of the 1960 twelfth and eleventh grade high school students. The 1965 High School Graduates (*Digest of Educational Statistics*, 1967 Edition, U.S. Office of Education, Government Printing Office, Washington, Table 65) were then distributed according to the probabilities derived from Project Talent.

Tables 2 and 3 represent the number of graduates of the high school class of 1965, and the number who enter or do not enter college, by ability and SES. Table 2 is for the year of high school graduation and Table 3 within 5 years of high school. Some of these 1965 high school graduates will enter college later than 5 years from high school, but the probabilities are small: .16 in the sixth year and .13 in the seventh for men; for women the probabilities are negligible after the fourth year.[5]

Five years after high school the saturation point has been approached (90 percent) in college attendance for those high school graduates in the top two ability groups (top 40 percent) who come from high SES families. But college attendance falls off sharply in these two groups as we descend the socioeconomic scale, so that in the top ability quintile only half of the low SES high school graduates will have entered college 5 years after high school—and the rest probably never will enter.

The influence of SES on these high ability, but low SES, students is particularly unfortunate, since the students in this group represent the top one-fifth of ability, and would be expected to score 500 or better on the College Entrance Examination Board's Scholastic Aptitude Test (SAT) which has a scale running from 200 to 800 points. The table below presents SAT score equivalents for each of the Project Talent ability quintiles for high school graduates.[6]

1. High (100–80%)—500 or better.
2. (80–60%)—418 or better.
3. (60–40%)—345 or better.
4. (40–20%)—275 or better.
5. Low (20%—)—below 275.

For *all* high school seniors the mean SAT-verbal score is about 375, and for all high school seniors *who enter college* the mean SAT-verbal score is 440 (boys) and 467 (girls).[7]

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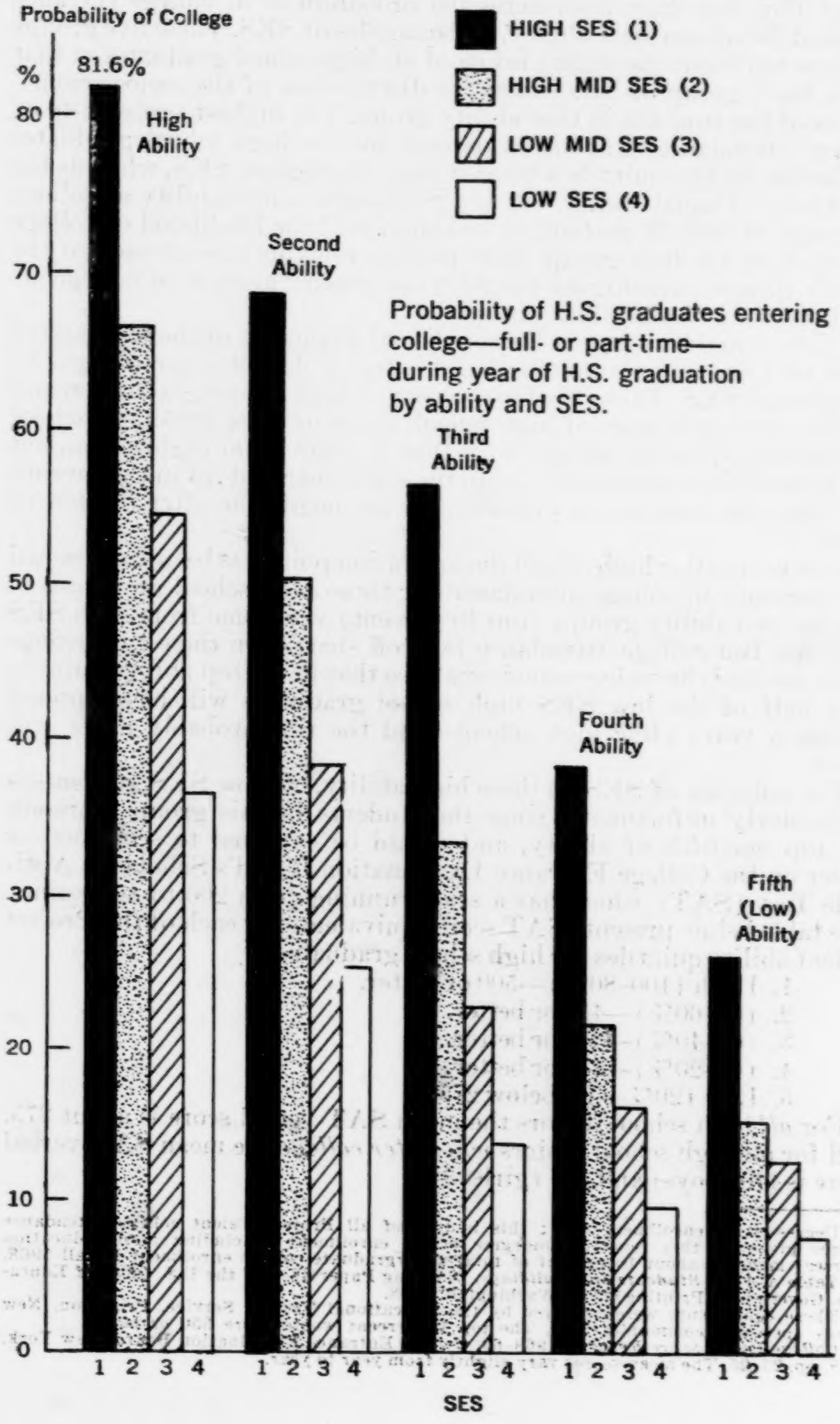
[4] Degree-credit enrollment only; this is true of all Project Talent college attendance figures given in this report. Nondegree credit enrollment (excluding adult education courses) made up about 10 percent of total undergraduate college enrollment in fall 1968.

[5] Table A–11 of *Students and Buildings*, Planning Paper 68–2 of the U.S. Office of Education, Government Printing Office, Washington, 1968.

[6] These equivalents were prepared by the Educational Testing Service, Princeton, New Jersey (personal communication). The top 10 percent would score 550 or better.

[7] *College Board Score Reports*, 1968–69, College Entrance Examination Board, New York, 1968, pp. 23–25. The mean scores vary slightly from year to year.

FIG. 1



Probability of H.S. graduates entering college—full- or part-time—during year of H.S. graduation by ability and SES.

TABLE 2.—*Probability of high school graduates entering college, full or part time, during the year following graduation, by ability and socioeconomic status*

Ability and socioeconomic status	Number of high school graduates in group	Number who enter college		Loss	
		Number	Percent	Number	Percent
High ability quintile (100 percent to 80 percent):					
1. High	203,000	165,000	82	37,000	18
2	153,000	102,000	66	51,000	34
3	122,000	67,000	55	55,000	45
4. Low	60,000	22,000	37	38,000	63
Total	538,000	356,000	66	181,000	34
2d ability quintile (80 percent to 60 percent):					
1. High	130,000	89,000	69	41,000	31
2	143,000	72,000	50	71,000	50
3	148,000	57,000	38	91,000	62
4. Low	94,000	24,000	25	70,000	75
Total	515,000	242,000	47	273,000	53
Subtotal (1 to 2 quintiles of ability)	1,053,000	598,000	57	454,000	43
3d ability quintile (60 percent to 40 percent):					
1. High	94,000	53,000	56	41,000	44
2	135,000	45,000	33	90,000	67
3	159,000	36,000	23	123,000	77
4. Low	148,000	20,000	14	128,000	86
Total	536,000	154,000	29	382,000	71
Subtotal (1 to 3 quintiles of ability)	1,600,000	752,000	47	848,000	53
4th ability quintile (40 percent to 20 percent):					
1. High	52,000	20,000	38	32,000	62
2	114,000	25,000	22	89,000	78
3	164,000	27,000	16	137,000	84
4. Low	169,000	16,000	10	153,000	90
Total	499,000	88,000	18	411,000	82
Subtotal (1 to 4 quintiles of ability)	2,100,000	839,000	40	1,261,000	60
5th (low) ability quintile (20 percent):					
1. High	36,000	10,000	27	26,000	73
2	75,000	11,000	15	64,000	85
3	133,000	17,000	13	116,000	87
4. Low	263,000	20,000	8	243,000	92
Total	507,000	58,000	11	449,000	89
Grand total (all ability quintiles)	2,600,000	900,000	35	1,700,000	65

Source: Project Talent, 5-year followup surveys.

TABLE 3.—*Probability of high school graduates entering college, full or part time, within 5 years of high school graduation, by ability and socioeconomic status*

Ability and socioeconomic status	Number of high school graduates in group	Number who enter college		Loss	
		Number	Percent	Number	Percent
High ability quintile (100 percent to 80 percent):					
1. High	203,000	192,000	95	11,000	5
2	153,000	120,000	79	33,000	21
3	122,000	82,000	67	40,000	33
4. Low	60,000	30,000	50	30,000	50
Total	538,000	424,000	79	114,000	21
2d ability quintile (80 percent to 60 percent).					
1. High	130,000	109,000	84	21,000	16
2	143,000	90,000	63	53,000	37
3	148,000	78,000	52	70,000	48
4. Low	94,000	34,000	36	60,000	64
Total	515,000	311,000	60	204,000	40
Subtotal (1 to 2 quintiles of ability)	1,053,000	735,000	70	318,000	30
3d ability quintile (60 percent to 40 percent):					
1. High	94,000	65,000	69	29,000	31
2	135,000	63,000	46	72,000	54
3	159,000	55,000	34	104,000	66
4. Low	148,000	35,000	24	113,000	76
Total	536,000	218,000	41	318,000	59
Subtotal (1 to 3 quintiles of ability)	1,600,000	952,000	60	648,000	40
4th ability quintile (40 percent to 20 percent):					
1. High	52,000	29,000	56	23,000	44
2	114,000	39,000	34	75,000	66
3	164,000	44,000	27	120,000	73
4. Low	169,000	29,000	17	140,000	83
Total	499,000	141,000	28	358,000	72
Subtotal (1 to 4 quintiles of ability)	2,100,000	1,100,000	52	1,000,000	48
5th (low) ability quintile (20 percent):					
1. High	36,000	14,000	40	22,000	60
2	75,000	21,000	28	54,000	72
3	133,000	25,000	19	108,000	81
4. Low	263,000	39,000	15	224,000	85
Total	507,000	99,000	20	408,000	80
Grand total (all ability quintiles)	2,600,000	1,200,000	46	1,400,000	54

Source: Project Talent, 5-year followup surveys.

In light of the above figures, how many of these high school graduates, as shown in Tables 2 and 3, who do not enter college represent a "reserve of talent" is problematical. Many of these students could benefit from technical-terminal programs of two-year colleges or other vocational training. No doubt some of these graduates who do not enter college have undiscovered potential, and others could achieve at higher levels were it not for cultural deprivation. There is certainly genuine loss of academically able students who do not enter college in the high ability quintile, where 114,000 (21%) high school graduates have not entered college after 5 years. Below this group, and especially below the second quintile, it is quite possible that there are few collegeable students.

George C. Keller, for example, begins his category of "academically talented" at 116 I.Q. (Binet) or one standard deviation above the mean of normal distribution. This group constitutes about 20 percent of the total school population. Above this group, the "gifted" with an I.Q. of 132, or two standard deviations above the mean, make up about 3 percent of the school population, and the "highly gifted," 148 I.Q., three standard deviations above the mean, constitutes .1 percent of the school population. Of the 2.3 million (actually 2.6) secondary school graduates in 1965, Keller classifies about 550,000 as academically talented, 90,000 gifted, and 3,000 highly gifted, for a total of 643,000. Yet, as Keller states, about 1.3 million graduates entered college that year, or more than twice the number of academically talented—in Keller's definitions. While Keller's totals of high school graduates and entering college students are a little shaky—first time college enrollment was about 1.4 million in fall 1965 and these are not all June 1965 high school graduates by any means—his point is made: far more students begin college than appear to be college-able. Keller would probably agree, nevertheless, that there are many students *not* entering college who should, as well as many who do enter who should not.[8]

William W. Turnbull, Executive Vice President of the Educational Testing Service, recently wrote that any proportional increases in college attendance are going to have to come more and more from the second to fourth quartiles of ability and these students score largely in the 200's and 300's on the SAT scale. Turnbull urges educators to face up to this fact.[9] If, however, we believe that any high school graduate should have an opportunity to try college, or at least be provided some college education and/or vocational training at the two-year college level, then there is a very large number of high school graduates who are not now doing so. If high school graduates from *all* socioeconomic categories went to college in the same proportion as high school graduates *of the same ability level*, but in the top socioeconomic quartile, an additional 600,000 students would enter college within 5 years of high school graduation. This would increase the number who attend college from each high school graduating class by 50 percent, for a total of 1.8 million college students from the 1965 high school graduating class of 2.6 million. Thus, 69 percent of that class would enter college.

IV. WHY SOME HIGH SCHOOL GRADUATES FAIL TO ENTER COLLEGE

The reasons why high school graduates do not enter college are complex, varied, and sometimes conflicting. Socioeconomic status, lack of interest, poor record in high school, and other reasons all have a function, but one very immediate reason, related to socioeconomic status, but not entirely so, is family size. The probabilities derived from Project Talent allow an analysis of the effect of SES combined with family size on college entrance. Unfortunately, the probabilities are not controlled for ability which obviously affects these relationships.[10]

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[8] George C. Keller, "The Search for Brainpower," *The Public Interest*, Summer 1966, pp. 56–69.

[9] "Relevance in Testing," in *Science*, 28 June 1968, pp. 1424–1429.

[10] Intelligence and family size are negatively correlated, however, and the coefficient is about —.30 for these two variables. The causes for this negative correlation are unclear, but several explanations have been advanced. The explanations range from birth exhaustion of the mother to less attention paid to children in large families thereby restricting their verbal development.

Table 4.—*Probability of entrance to college, full or part-time, during the year after high school, by SES and family size*

Size of family	SES High, 1	2	3	Low, 4
2 to 4	68.7	43.1	31.1	16.3
5 to 6	62.8	38.7	26.4	14.1
7 to 8	55.1	34.8	20.0	10.6
9 to 11	53.4	26.0	20.5	10.6
12 or more	41.2	25.5	10.8	7.4

Source: Project Talent, 5-year followup surveys.

Family size includes parents, so the number of children would run from 2 to 10 or more, or from 1 to 11 or more in the case of one-parent families. (The latter make up about 13 percent of all families in the U.S.) As can be seen from the table, size of family does affect college entrance; for instance in the high SES families, as we descend the scale from small to very large families, college entrance falls off from more than two-thirds to slightly more than 40 percent. The effect of family size is even more apparent as we move across the income scale within same size families, but here ability obviously plays a larger part since we know from data presented earlier that ability increases as we ascend the SES scale. From this table, however, it is apparent that the effect of SES on college entrance is increased by size of family. An immediate influence of family size would be relatively less income available for educational purposes as size of family increases, and a collateral effect of a high school graduate having to begin work rather than college in order to help support his family.

When high school seniors are asked what their main reasons would be for not attending college they give a wide variety of answers. A longitudinal study from 1959 to 1963 of 10,000 graduates of 37 high schools in 16 communities located in 9 States provided the following reasons.[11]

Table 5.—*Seniors' main reasons for possibly not attending college*

[In percent]

Main reason	Men	Women	Total
Poor high school grades, ability	21	10	15
Not enough money	32	29	30
Prefer to work	14	19	17
Prefer marriage	3	19	11
Not interested enough	18	14	16
Family opposition	1	1	1
Health of self or family	1	1	1
Military service	1	----	1
Other	3	2	2
No answer	6	5	6

The two most cited reasons (both sexes combined) were "not enough money" and "prefer to work." Lack of interest, poor ability or low grades, or a preference for marriage in the case of women, were close behind, but lack of money is the predominant reason. This table unfortunately fails to control for SES or ability which would make it much more useful. Another examination of high school seniors' reasons for not planning on college, however, does control for family income.

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[11] Leland L. Medsker and James W. Trent, *The Influence of Different Types of Public Higher Institutions on College Attendance from Varying Socioeconomic and Ability Levels*, Center for Research & Development in Higher Education, University of California, Berkeley, 1965, page 24.

In Fall 1965, the Current Population Survey of the U.S. Bureau of the Census found that about 3 in 10 students in a national sample of high school seniors (N=2,957) did not plan on entering college. An additional 1 in 10 were undecided. These two groups were then asked to pick their chief reason for not planning on college. The family income is only stated in a crude dichotomy of over or under $5,000, but a useful pattern still results.[12]

TABLE 6.—*Chief reason for not planning on college and family income*

[In percent]

Chief reason for not planning on college	Family income	
	Under $5,000	$5,000 and over
Learning a trade	21	32
Taking a job	30	21
No desire	14	20
Finances	18	10
Marriage	10	10
Scholarship	7	7
Total	100	100

Family income appears unrelated to scholarship or marriage, but finances and taking a job are more important for the lower income students. Lack of desire for college is greater with the higher income students indicating that the objective factors become less important and personal inclinations more so as income increases. The author of this report feels that taking a job is primarily, but not entirely, a matter of choice rather than need. About 20 percent of students with family incomes between $5,000 and $7,499 specified taking a job, but the same proportion with incomes of $7,500 and over also so specified. In summary of this data, the objective deterrents to college plans are less relevant than the preference for alternate options. Jaffe's data, then, agrees in some categories with Medsker's and Trent's data and conflicts with others. But the latter results may be influenced by a bias deliberately introduced by Medsker and Trent into their study.

Since they wished to evaluate the relationship between the availability of various types of institutions of higher education and the rate of college attendance, the northeastern and southern United States were excluded from their survey. It was feared that the emphasis on private colleges in the Northeast, and the racial and socioeconomic problems of the South, would distort the relationship the authors were seeking to determine. Jaffee's results are from a national probability sample.

Additional information on obstacles to college attendance has been developed by the SCOPE project (School to College: Opportunities for Postsecondary Education). This project, sponsored by the Center for Research and Development in Higher Education at the University of California-Berkeley and the College Entrance Examination Board, involves nearly 90,000 high school freshmen and seniors in 4 States: California, Illinois, Massachusetts, and North Carolina.

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[12] A. J. Jaffe, "Reasons For Not Planning on College," an unpublished progress report to the U.S. Office of Education, December 1966, for a research project supported by the Office.

TABLE 7

	Boys		Girls	
	Number	Percent	Number	Percent
Greatest obstacle to college attendance: [1]				
(*a*) Too expensive	1,968	11.7	2,525	14.7
(*b*) Grades not good enough	3,805	22.7	2,957	17.2
(*c*) Parents object to it	142	.8	117	.7
(*d*) Prefer to get a job	576	3.4	1,384	8.0
(*e*) Prefer to get married	334	2.0	1,485	8.6
(*f*) Do plan to go to college [2]	4,626	27.6	5,428	31.6
(*g*) Military service	1,887	11.2	82	.5
(*h*) Lack of interest	1,245	7.4	1,252	7.3
(*i*) Do not know	1,458	8.7	1,500	8.7
(*j*) No response	725	4.3	469	2.7

[1] *SCOPE, Four-State Profile*, grade 12, 1966, College Entrance Examination Board, New York, December 1966, p. 33. This table is derived from the high school seniors only. The 4 States were chosen because of the different ways they are planning for education beyond high school. A possible source of bias may exist in this data due to the lack of participation by certain metropolitan school districts particularly in Massachusetts.

[2] Indicates students who see no obstacles at all to college entrance.

Here again, finances do not seem to be the major deterrent, grades for the boys being a much larger hindrance. But much of this evidence again conflicts with the results presented earlier. (About 70 percent of the seniors in the SCOPE study expect to go to college sometime, and about 60 percent have decided on a particular college.) The SCOPE data is, however, not controlled for SES or ability.

The available evidence, then, on obstacles to college entrance is conflicting and not easy to place in a pattern or trend. Objective factors such as lack of money do not seem to be of overwhelming importance, and the factors of inadequate academic background and lack of interest combined exceed lack of finances as a reason in all three studies. Of course, offers of financial aid may decrease the number who cite lack of interest as a reason for not planning on college. Motivation to enter college is an intangible item affected by a great many factors in a high school student's life. One of the most important of those factors is the amount of encouragement he receives from his parents.

The education of the parents, one of the determinants of SES, is a significant influence on the college plans and college attendance of high school seniors. A longitudinal study of a large (N=9,007), randomly selected cohort of seniors from all Wisconsin high schools who were followed from 1957 to 1964 revealed the effect of parents' education on their children. The higher the level of parents' education the more the children were encouraged to plan on college, attend college, and graduate. This is hardly surprising, but it is interesting that this relationship was true with or without controlling for the senior's intelligence.[13]

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[13] William H. Sewell and Vimal P. Shah, "Parents' Education and Children's Educational Aspirations and Achievements", *American Sociological Review*, April 1968, pp. 191–209.

Another study using a national probability sample of high school seniors and their mothers, gathered through the October 1965 Current Population Survey (N=2,957 seniors), found, however, that the mothers' wishes were even more strongly related to planning on college by the seniors than was the actual educational attainment of the mother.[14]

An earlier report on the Wisconsin study of high school seniors, completed before the follow-up study described above, showed for this sample (N=10,318), of about one-third of all Wisconsin high school seniors, that parental encouragement to attend college is a powerful intervening variable between social class background and intelligence of the child and his educational aspirations.[15]

Trent and Medsker, in their longitudinal study of 10,000 high school graduates, selected all the high school graduates who placed in the upper 30 percent of the sample's distribution of ability scores; then by controlling for SES as well as ability, they were able to show the relationship between parental encouragement, SES, and ability for those who did not enter college, those who did, and who either persisted in college or withdrew.[16]

TABLE 8.—*Parental encouragement as reported by subjects of high academic aptitude, by socioeconomic status in percentages*

SES and encouragement	(Number)	Persisters (percent)	Withdrawals (percent)	Nonattenders (percent)	Chi square
High:					
Strong encouragement	(295)	80	16	4	[1]67.70
Other	(73)	41	26	33	
Middle:					
Strong	(606)	61	27	12	[1]247.70
Other	(436)	23	20	57	
Low:					
Strong	(101)	50	28	22	[1]67.56
Other	(132)	8	21	71	

[1] $p<.01$.

Considering that ability is held constant in this table, and SES controlled, the influence of parental encouragement is apparent: the higher the SES the greater the encouragement by parents to attend college, whereas the nonattenders show either lack of encouragement for college by parents or encouragement to do something else, and this tendency increases as SES decreases.

The SCOPE survey reported high school seniors' perceived parental encouragement to attend college:[17]

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[14] A. J. Jaffe and Walter Adams, "Predictors of College Plans of High School Seniors, Fall 1965," December 1966, an unpublished progress report to the U.S. Office of Education.

[15] William H. Sewell and Vimal P. Shah, "Social Class, Parental Encouragement, and Educational Aspirations," *The American Journal of Sociology*, March 1968, pp. 559–572.

[16] James W. Trent and Leland L. Medsker, *Beyond High School*, Center for Research and Development in Higher Education, University of California, Berkeley, 1967, pp. 299–300.

[17] See footnote 1 of table 7.

TABLE 9

	Boys		Girls	
	Number	Percent	Number	Percent
Mother's wish re student's college education:				
A. Definitely desires it	8, 247	49. 2	6, 398	37. 2
B. Encourages without insisting	4, 243	25. 3	5, 448	31. 7
C. Desires it, but lacks funds	484	2. 9	769	4. 5
D. Indifferent	2, 322	13. 8	3, 288	19. 1
E. Opposes, but does not forbid	142	. 8	249	1. 4
F. Will not permit	49	. 3	56	. 3
G. Do not know	545	3. 3	535	3. 1
H. No response	734	4. 4	454	2. 6
Father's wish re student's college education:				
A. Definitely desires it	7, 922	47. 3	6, 349	36. 9
B. Encourages without insisting	3, 716	22. 2	4, 408	25. 6
C. Desires it, but lacks funds	433	2. 6	612	3. 6
D. Indifferent	2, 472	14. 7	3, 337	19. 4
E. Opposes, but does not forbid	147	. 9	267	1. 6
F. Will not permit	52	. 3	58	. 3
G. Do not know	1, 231	7. 3	1, 645	9. 6
H. No response	789	4. 7	522	3. 0

The data is not controlled for ability or SES, but it is apparent that boys receive significantly more encouragement for college than do the girls. Similarly, the data reported by Jaffe and Adams from the Current Population Survey also showed less parental encouragement for daughters to attend college than sons: the girls planned on college less than the boys and received less encouragement to attend college. This difference steadily decreases as the mother's own educational attainment increases until there is hardly any difference at all if the mother attended college. But there is increasing reluctance for mothers, as educational attainment is reduced, to favor college for their daughters. The trend is true for the boys, also, but much less pronounced. As Jaffe and Adams point out, however, this trend is not true for nonwhite mothers, so that for all sex-color groups white girls and their mothers show the least interest in college.[18]

Obviously, as Sewell and Shah put it, perceived parental encouragement to plan on and enter college is a "powerful intervening variable" between SES and intelligence of the child and his aspirations for education, but "at the same time there is still a good deal of variance in college plans of the socioeconomic classes that is not explained . . . by parental encouragement and (children's) intelligence." "This leads to the question of what other factors may help to explain social class differences." [19]

McDill and Coleman analyzed peer influence on college plans in six high schools in Illinois as well as the relative effects of family background and peer influence at the freshmen and senior years of high school. They found that in the freshman year both family background and high school social status were significantly related to college plans but that family influence was much the greater. But by the senior year high school social status became a more important source of variation in plans for college than the parents' educational attainments. This held true irrespective of family background. Also this effect was more true of boys than girls: the school social system had more influence on the college plans of boys than of the girls.[20] Peer influence, then, means that the high school social status system is less able to remove the mother's restraint on plans for college by their daughters, as noted above.[21]

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[18] Jaffe and Adams, "'Predictors of College Plans."

[19] Sewell and Shah, "Social Class . . . and Educational Aspirations".

What, then, can we finally say about the reasons for entrance to college or failure to enter? Obviously, parental encouragement is of great importance, one that can reduce the influence of socioeconomic status. But parental influence upon college plans of high school students is also influenced by SES—the higher status families tend to show more encouragement to their children.

As the authors of *Beyond High School* summed up their observations on patterns of college attendance: "In the final analysis it was not lack of finances that appeared to be primarily related to failure to attend college, but lack of interest . . . the factor most related to entrance and persistence in college is motivation. Apart from ability, the values of the youths and their parents seemed to figure more than finances in the relationship between socioeconomic status and college attendance. These values appeared to be major contributors to motivational differences. The signs are that this motivation is formed early in life, probably largely in response to parental influences and early school experiences." [22]

V. WHERE DO THEY GO TO COLLEGE?

The new college student enters one of two broad types of college: two-year or four-year. The proportion of freshmen entering two-year colleges is growing steadily, from about 23 percent in 1960 to 28 percent in 1966. Most of this is enrollment in public two-year colleges, since private two-year college enrollment made up only about 13 percent of total junior college enrollment in 1965–66, down from 15 percent in 1960.

An examination of entrants to four-year and two-year colleges reveals some significant differences in ability and socioeconomic status of the students who attend these colleges.

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[20] Edward L. McDill and James Coleman, "Family and Peer Influences in College Plans of High School Students", *Sociology of Education,* Winter 1965, pp. 112–126.

[21] The conclusions of McDill and Coleman that peer values exert more influence on educational plans than parents do has been challenged. Kandel and Lesser in a recent article found that peer influence is important, but high school students, their peers, and parents tend to be in considerable agreement over educational plans with the parents' values exerting greater influence on educational goals than peer values. See Denise B. Kandel and Gerald S. Lesser, "Parental and Peer Influences on Educational Plans of Adolescents," *American Sociological Review,* April 1969, pp. 213–223.

[22] Trent and Medsker, pp. 316–318. Note that the authors said "apart from ability." Sewell and Shah found that the child's intelligence had a strong effect on college attendance which was independent of the parent's education. "Parents' Education and Children's Educational Aspirations and Achievements."

TABLE 10.—*Distribution (percent) of freshmen entering 4-year public and private colleges, in the year of high school graduation, full-time and degree credit, by SES and ability*

Ability	Socioeconomic status				
	1 (high)	2	3	4 (low)	Total
1 (high)	20.5	12.2	8.0	2.4	43.1
2	10.3	8.0	5.9	2.5	26.7
3	5.7	4.8	3.5	2.0	16.0
4	2.0	2.5	2.3	1.6	8.4
5 (low)	1.0	1.1	1.7	2.0	5.8
Total	39.5	28.6	21.4	10.5	

Source: Project Talent, 5-year follow-up surveys.

TABLE 11.—*Distribution (percent) of freshmen entering all 2-year colleges, in year of high school graduation, full-time and degree credit, by SES and ability*

Ability	Socioeconomic status				
	(high) 1	2	3	(low) 4	Total
1 (high)	3.9	6.5	4.7	3.4	18.5
2	9.2	8.2	7.5	4.1	29.0
3	9.7	4.9	7.2	4.1	25.8
4	3.9	4.2	5.9	2.4	16.4
5 (low)	1.9	1.7	4.1	2.6	10.3
Total	28.6	25.2	29.4	16.6	

Source: Project Talent, 5-year follow-up surveys.

Compared to the four-year colleges, the junior colleges take more of their students from the low half of the SES: 46 percent for the 2-year colleges and 32 percent for the 4-year colleges. In ability, the 4-year colleges get 70 percent of their students from the top 40 percent of high school graduates, but the 2-year colleges find 47 percent of their students in that top 40 percent of students. While the 4-year colleges receive only 30 percent of their new students from the third to last quintile of ability, the 2-year colleges find about 53 percent of their students in those groups.

A 2-year college ought to be particularly concerned to attract students of low SES and low ability—since that is the reason for the "open door" policy of most of these colleges. While the junior colleges do enroll more of these students than the 4-year colleges, the differences are not as great as is often believed. The sharpest difference between the two types of colleges is in the high ability quintile, with the 4-year colleges deriving 43 percent of their students from this group and the junior colleges only about 18 percent. But the junior colleges do not make up for this with a large proportion of their students entering from the lowest ability quintile, rather these colleges take most of their students—73 percent—from the top 60 percent of the students, with the rest—about 27 percent—coming from the bottom 40 percent of ability. The corresponding figures for the 4-year colleges are 86 percent and 14 percent.

A recent study of junior college students, using Project Talent 1-year follow-up survey data, compared these students with those in the sample who attended 4-year colleges or who did not enter college at all. This study found that there "is a tendency for junior college students to be more like non-college students in terms of ability, and slightly more like college students in terms of socioeconomic factors."[23] This conclusion is supported by the data presented here based on the Project Talent 5-year follow-up surveys. Other studies of junior college students also confirm this general trend.

Jaffe and Adams, using 1960 Census data, compared 2 and 4-year college students in I.Q. and parental occupations.

Among U.S. high school graduates who entered college in fall 1960, there was considerable difference in I.Q. test scores: (percent)

Four-year colleges:	
Top half	89
Bottom half	11
Two-year colleges:	
Top half	62
Bottom half	38

But there were less sharp differences in occupation of the heads of households from which the students came: (percent)

Four-year colleges:	
White collar workers	59
Blue collar workers, including unemployed	34
Agriculture	7
Two-year colleges:	
White collar workers	47
Blue collar workers, including unemployed	51
Agriculture	2

A rough income dichotomy shows little income variation: (percent, and 1960 incomes)

Four-year colleges:	
Under $6,000 per year	36
$6,000 and over per year	64
Two-year colleges:	
Under $6,000 per year	40
$6,000 and over per year	60

On the I.Q. tests, the junior college students resembled the non-college students, 62 percent and 53 percent respectively in the top half, more than the four-year college students with 89 percent in the top half. In high school class standing, the junior college students and those students not planning on college were even closer: 43 percent of the former were in the top half of the distribution, and 41 percent of the non-attenders, but 78 percent of the four-year college students were in the top half.

The authors of this study conclude from their data that two-year and four-year colleges are only partly in competition for the same students. A somewhat different type of student is attracted to the two-year college, and who might not otherwise have attended a four-year college.[24]

We can also conclude from their data a reinforcement of the earlier observation that junior college students resemble non-college high school graduates in ability, but tend to resemble 4-year college students in SES.

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[23] William W. Cooley and Susan J. Becker, "The Junior College Student," in *The Personnel and Guidance Journal*, January 1966, pp. 464–469.

[24] From "Who Goes to Junior Colleges?" in A. J. Jaffe, Walter Adams, and Sandra G. Meyers: *Negro Higher Education in the 1960's*, New York, 1968, pp. 101–104.

The private and public four-year colleges are quite similar in the ability and socioeconomic status of their students. With the exception of the high ability-high SES group, the four-year colleges, public or private, show little difference in the abilities and SES of the students they enroll.

TABLE 12.—*Distribution (percent) of freshmen entering 4-year private institutions of higher education in the year of high school graduation, full-time and degree credit only, by ability and SES*

Ability	Socioeconomic status				
	1 (high)	2	3	4 (low)	Total
1 (high)	27.2	11.5	7.3	2.1	48.1
2	10.3	6.7	5.4	2.1	24.5
3	5.5	4.2	2.8	1.5	14.0
4	2.4	2.6	1.4	1.1	7.5
5 (low)	.7	1.6	.9	1.7	4.9
Total	46.1	26.6	17.8	8.5	

Source: Project Talent, 5-year followup surveys.

TABLE 13.—*Distribution (percent) of freshmen entering 4-year public institutions of higher education, in year of high school graduation, full-time and degree credit only, by SES and ability*

Ability	Socioeconomic status				
	1 (high)	2	3	4 (low)	Total
1 (high)	16.0	12.6	8.4	2.5	39.5
2	10.3	8.8	6.2	2.7	28.0
3	5.8	5.2	3.8	2.2	17.0
4	1.7	2.3	2.7	1.8	8.5
5 (low)	1.1	.6	2.2	2.1	6.0
Total	34.9	29.5	23.3	11.3	

Source : Project Talent, 5-year fellowship surveys.

Unfortunately, these tables do not permit a finer breakdown into the top 10 or 5 percent of students in ability or SES. It would be interesting to see the distribution of our very best students in both SES and ability combinations. A plausible hypothesis would be that as the high ability and high SES combination is narrowed, the private colleges would take a larger and larger share of these students. Also, these tables do not allow a breakdown of students, by ability and SES, into type as well as control of institution—by private and public university or college, church-related or secular.

Tables 10–13, then, reveal that entrance to four-year or two-year colleges, still rests heavily on the top three quintiles of ability—86 percent for the four-year colleges and 73 percent for the two-year—and while the junior colleges have increased the proportion coming from the bottom half of the ability scale, they have not increased it very much.

The two-year colleges will probably, and gradually, increase proportional attendance in college by high school graduates as these colleges increase in number, especially in the large cities. But once the high school graduates enter college—no matter where—do they stay the course? What effect does SES and ability have on completion of college?

VI. COMPLETION OF COLLEGE

In the cohort of high school students followed up by Project Talent five years after high school, 58.5 percent of those who entered college full-time in the year of high school graduation had received a baccalaureate degree 4 years later. In this college group, therefore, 41.5 percent had either left college or were still in college without a degree at the end of four years. About 850,000 entered (full-time) and about 500,000 received a degree after four years. Table 14 presents the probabilities for receipt of a bachelor's degree within four years of high school (percentages within the cells) and the actual distribution of those who received degrees.

TABLE 14.—*Probability of freshmen entering college (full time) in year of high school graduation to receive a baccalaureate degree after 4 years, by ability and SES*

Ability	Socioeconomic status				
	1 (high)	2	3	4 (low)	Total
1 (high)	78.1	63.0	66.4	65.9	49.5
2	59.1	55.9	56.8	65.3	26.9
3	47.7	51.6	47.0	54.1	14.4
4	43.9	35.3	37.0	38.3	6.0
5 (low)	30.4	44.8	23.4	28.7	3.2
Average (actual)	42.8	27.2	20.0	10.0	

Source: Project Talent, 5-year followup surveys.

It is apparent from Table 14 that although SES strongly conditions entrance to college, its role is diminished in determining completion of college. Within ability groups, the probabilities for receipt of a degree are much closer together than they are for entrance to college (see Table 2). Of those who received degrees, 70 percent came from the top half of the SES scale, but 76.4 percent came from the top 40 percent of the ability scale, with about half of the degree recipients in the top quintile alone.

Family size similarly exhibits less effect on degree attainment, by SES and size of family, than it did on entrance to college. The probabilities show a much more gradual decline, as family size increases or income decreases, compared to the sharp downturn in probabilities shown in the family size table for college entrance.[25] (See table 4.)

The authors of *Beyond High School* also found that "ability and socioeconomic status were more related to entrance into college . . . than to persistence in college." [26] But this should not be taken to mean that socioeconomic status no longer is an important influence on graduation from college. The longitudinal study of Wisconsin high school graduates shows that "socioeconomic status never ceases to be an important factor in determining who shall be eliminated from the contest for higher education . . ." [27] Sewell and Shah point out that when only those who entered college are considered, in their study, "intelligence is more important than socioeconomic status in determining who will eventually graduate." "Prior socioeconomic selection has already exerted much of its influence on who attends college. However, even among this group socioeconomic status continues to exert an influence that is independent of intelligence in determining college graduation for both sexes." Analysis of the Wisconsin cohort shows that socioeconomic status tends to exert more influence on females' plans for college, entrance to college, and graduation, than males, who are more influenced by intelligence, but both factors continue to affect both sexes throughout the educational process.

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[25] Project Talent, 5-year follow-up surveys.

[26] James W. Trent and Leland L. Medsker, *Beyond High School*, University of California, Berkeley, 1967. This is a longitudinal study of 10,000 high school graduates followed from 1959 to 1963. The sample was drawn from 16 communities of varying sizes and kinds across the U.S. The study was supported by a contract with the U.S. Office of Education and was done under the auspices of the Center for Research and Development in Higher Education. This is the second of three studies based on the same sample; the first was referred to earlier, and the third will appear in 1969.

Although only 58.5 percent of the college students in the cohort surveyed by Project Talent graduated from college four years after high school, that percentage is, perhaps, higher than the national average. Summerskill, in an extensive review of studies on college dropouts, reports that in the aggregate about half of all college students drop out in the four years after matriculation, and that about 40 percent graduate on schedule, and another 20 percent will additionally graduate from some college some day.[28] He also states that the ". . . attrition rate has not changed appreciably in the past forty years." This unchanging attrition rate parallels the conclusion of Jaffe and Adams (see above) that the entrance rate to college in the U.S. has not changed significantly since 1880. It appears that the increase in college graduates is also primarily a function of population growth, as is the rate of college entrance.

Eckland, however, has shown that of an age cohort of 1,332 males who entered the University of Illinois in 1952 as full-time students, of every ten of them, four graduated in continuous progression, one graduated elsewhere in continuous progression, and five dropped out. Three of the five dropouts later returned to college, with one graduating at Illinois, one graduating elsewhere, and the third failing for a second time. Overall then, seventy percent graduated somewhere and thirty percent did not. Eckland followed his sample for ten years.[29] Similar findings are reported for the entering class of 1955, at Pennsylvania State University, and for the entering class of 1961 at the University of California, Berkeley.[30] But as Trent and Medsker point out, these studies were all of students at large and relatively select universities, and if students at the public four-year and two-year colleges were included, the dropout and return proportions would have been much different. This appears to be true in Trent's and Medsker's own study where only 28 percent of their sample had received a degree in four years, but an additional 24 percent were still in college without a degree. Forty-eight percent of the sample were no longer in college.[31] Trent's and Medsker's data, unlike most other surveys of college dropouts, allow an examination of college persistence by type of institution, ability, and socioeconomic status. The Project Talent data presented earlier does not allow an examination of dropouts by type of institution, nor does it permit discrimination between actual dropouts and those still in college without a degree at the end of four years.

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[27] William H. Sewell and Vimal P. Shah, "Socioeconomic Status, Intelligence, and the Attainment of Higher Education," *Sociology of Education*, Winter, 1967 pp. 1–23.

[28] John Summerskill, "Dropouts from College," in Nevitt Sanford, editor, *The American College*, New York, 1962, pp. 627–657. "Dropout" here means leaving college for any reason. The somewhat higher completion rate for Project Talent is probably due to its being limited to full-time students only. See Table 14.

[29] Bruce K. Eckland, "College Dropouts Who Came Back," *Harvard Educational Review*, Summer, 1964, pp. 402–420.

[30] See the discussion in Trent and Medsker, *Beyond High School*, pp. 95–96.

Below is a table from *Beyond High School* showing the distribution of students after four years.

TABLE 15.—*Educational status in June 1963, of students who entered different types of colleges full time, September 1959*

Type of college entered in 1959	Number	Bachelor of arts degree secured (percent)	In college without degree (percent)	No longer in college (percent)
2-year college:				
Public	1,104	11	22	67
Extension center	241	17	29	54
Private	58	21	12	67
4-year college:				
Public	1,000	27	23	50
Church related	446	48	20	32
Private, nonsectarian	167	44	22	34
University:				
Public	694	36	30	34
Church related	103	58	24	18
Private, nonsectarian	100	52	25	32

About half of the college entrants in this sample withdrew from college within four years, thus paralleling the results of other dropout studies, and conforming to the pattern that appears to have existed for thirty or forty years at least.[32] The private college students consistently show greater persistence in college than do those in public institutions, and universities exhibit more student persistence than four-year colleges, which show more persistence than students who began in two-year colleges. Since private colleges usually enroll more select students than public colleges it is not surprising that their students show more persistence.

The table below shows ability levels of college persisters and withdrawals from the *Beyond High School* sample.

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[31] Alexander Astin and Robert Panos ("Attrition Among College Students." *American Educational Research Journal,* January 1968, pp. 57–72), using a sample of 36,000 students at 246 institutions, found that 65 percent of the sample had completed four years of college with or without a degree four years after entering in 1961.

[32] Forty-nine percent of the withdrawals left college before the second year, 30 percent before the third year, 17 percent before the fourth year, and 4 percent during the fourth year. Eckland, "College Dropouts Who Came Back," shows that the longer a students is in college before withdrawing, the more likely he is to return.

TABLE 16.—*Ability levels of college persisters and withdrawals, in percentages*

Ability level	Men		Women	
	Persisters 793	Withdrawals 386	Persisters 620	Withdrawals 504
High	66	44	60	46
Middle	27	40	34	39
Low	7	16	6	15
Chi square	([1] 52.63)		([1] 36.97)	

[1] $p<.01$.

The relationship between ability and persistence in college is evident in this table, but lack of ability cannot account for many of the withdrawals from college. Here the high and low groups represent students who scored in the top or bottom 30 percent of ability as determined by the distribution of scores, when seniors in high school, on the School To College Aptitude Test (SCAT). Although the largest proportion of withdrawals was from the top ability group, this was the only group where there were more persisters than dropouts. More importantly, since the study sample was followed only four years beyond high school we, cannot tell how many of the withdrawals will return to college and receive a degree—and other evidence indicates that it is the higher ability students who are both more likely to return and to go on to a degree.

Although many dropouts came from the high ability group, this is partly because this group makes up such a large amount of the students. Ability does, of course, affect persistence in college. Eckland found in his study of dropouts at the University of Illinois that 90 percent of the Illinois entrants who ranked below the 20th percentile in their high school class became dropouts, and only one in three of these would ever return and attain a degree. Those entrants who ranked above the 79th percentile had only 30 percent dropping out and almost 90 percent would eventually graduate.[33]

The *Beyond High School* sample showed that socioeconomic status is still related to college persistence or withdrawal, but not as much as ability, particularly for the men. This confirms the conclusions reached by Sewell and Shah about the effects of ability and SES already noted.

As can be seen in the data presented earlier, two-year college students were by far the least successful in attaining a bachelors degree in four years. This is partly due to the transfer phenomenon. Trent and Medsker note that thansfer students were largely responsible for the large number of students who persisted in college four years but had not yet received a degree. But they also point out that transfers from four-year colleges differed somewhat from transfers from two-year colleges, and that two-year college transfers had a statistically higher rate of attrition even after having attended college for at least two and a half years. (They did not control for ability here.)

The largest reason for the lack of success by two-year college students is while they are still in junior college. The attrition rate at public two-year colleges is enormous. California has the most highly developed system of two-year community colleges, yet in fall, 1965 freshmen comprised 75 percent of full-time enrollment in day graded classes (ungraded classes are for adults) and sophomores 25 percent. Of the part-time students 77 percent were freshmen and 23 percent sophomores. In spring, 1967, freshmen comprised 66 percent of the full-time enrollment and sophomores 33 percent. The part-time enrollment was 75 percent freshmen and twenty-five percent sophomores.[34] The increase in full-time sophomores in the spring, 1967 semester is not due to improved retention, but due to the large numbers of freshmen who do not return to the second semester thereby increasing the proportion of sophomores. Thus about two out of three freshmen who enter two-year colleges in California do not return for the second year.[35] Some of these students transfer to a four-year institution directly from the first year. Also there is a reverse phenomenon: some students enter two-year colleges after initially entering a four-year college. At California's San Jose Junior College, "so many reverse-flow students were received at the beginning of each semester that the junior college predicted its enrollment for the last half of the academic year on the basis of 'first our own current enrollment and second, whatever information we may obtain from San Jose State (College) with reference to potential eliminations at the close of the fall quarter.' "[36]

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[33] Eckland, "College Dropouts Who Came Back," p. 414.

The open door is also a revolving door. San Jose Junior College is, perhaps, not typical of all two-year colleges, for it is primarily a feeder college for the nearby San Jose State College. Although two-thirds of the entering students at San Jose Junior College regarded themselves as transfer students, only about one-third of these actually transfer; this is about 22 to 25 percent of all students who enter.[37]

Reasons for withdrawal from college are complex and ambiguous, or even conflicting, just as they were for failure to enter college in the first place. Trent and Medsker asked the students in their sample, while they were still high school seniors, what their most likely reasons would be for not finishing college. Their answers are tabulated below.[38]

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[34] Source: *Junior College Active Enrollments,* fall 1965 and spring 1967, California Community Colleges, Sacramento. The fall 1968 enrollment figures show that 73 percent of the full-time students were freshmen and 27 percent sophomores; of the part-time students 76 percent were freshmen and 24 percent sophomore. Large annual increases in the number of freshmen cannot be responsible for the freshman-sophomore disparity, since between fall 1965 and fall 1968 the number of full-time freshmen increased by only about 27,000, and part-time freshmen increased by only about 44,000.

[35] Although some of the students who do transfer to a four-year college do so before completing two years in a junior college, it is apparent that most students in two-year colleges neither transfer to a four-year institution nor complete two-year terminal programs. Yet, 70 percent of public two-year college students believe that the benefit of college is monetary—compared to 50 percent of students in all four-year colleges. (See *National Norms for Entering College Freshmen—Fall 1967,* American Council on Education Research Reports, Volume 2, No. 7, 1967, p. 35. This is a sample of 280,650 entering freshmen at 359 institutions, and is weighted so as to be representative of the defined population of entering freshmen students.) However, unpublished data calculated by the Office of Planning and Evaluation of the U.S. Department of Health, Education, and Welfare shows that the extra earnings for attendance at college, *without receiving a bachelor's degree,* is only $615 a year more than if the student had just completed high school and never entered college at all. This figure is for 1966 and is adjusted to allow for the effects of age, sex, race, region (south-nonsouth) and whether part or full-time work. This does not allow for income foregone while in college or the costs of education. Adjusting for foregone income, and assuming $5,000 per year for two years of college in foregone income, means that the extra earnings for partial college would be only $400 per year—without allowing for education costs which are small in public two-year colleges.

[36] Burton R. Clark, *The Open Door College, A Case Study,* New York, 1960, p. 67.

[37] Clark, *Open Door College,* pp. 65–68. Of the students who transferred to the nearby four-year State college, about 29 percent had actually been at that college *before* entering the junior college.

TABLE 17.—*Anticipated reason for withdrawl as reported in 1959, by eventual college persisters and withdrawls, in percentages*

Anticipated reason for withdrawal	Men			Women		
	Persisters (N=793)	Withdrawals (N=638)	Z Ratio	Persisters (N=620)	Withdrawals (N=504)	Z Ratio
Academic	37	39	[1] 0.73	16	14	[1] 0.61
Financial	41	32	[2] 2.87	29	25	[1] 1.35
Circumstantial [3]	15	16	[2] 2,73	50	50	[1] 0.17
No answer, don't know	7	13	[2] 3.22	5	11	[2] 2.80
Chi square	[2] (14.71)		------------	[4] (8.92)		------------

[1] P=not significant.
[2] P<.01.
[3] Circumstantial includes "marriage, health, catastrophe, and other."
[4] P<.05.

Financial reasons lead for the men who persisted in college, whereas thosse who eventually withdrew saw academic difficulties as their likely trouble. The women overwhelmingly chose circumstantial (obviously marriage) as their most likely reason to withdraw, with finances second.

Motivation seemed to be very important for this sample, since 72 percent of the male persisters rated college as extremely important to them, but only 44 percent of the withdrawals did so. The women's ratings were 69 and 40 percent respectively. Twenty percent of those who withdrew (both sexes) were indifferent about the importance of college, but only seven percent of the persisters were. As noted earlier, parental encouragement was a powerful influence to both attend college and to persist there. (See section 4.) The college persisters overwhelmingly received strong encouragement from their parents to attend college, the withdrawals and non-attenders much less so. Such encouragement increased as SES increased.

Also the college persisters placed more value on general education, whereas the withdrawals and non-attenders gave more importance to vocational training.[39]

Astin and Panos, in their analysis of a large sample of students who left their college of matriculation, scored the first, second, and fourth major reasons for the men leaving as due to changing career plans, dissatisfaction with the college, or wanting time to reconsider interests and goals. Finances was only the third major reason, and academic failure fifth. For the girls, marriage, dissatisfaction with the college environment, and changing career plans were first, second, and third, respectively, in major reasons for leaving. Finances was fourth, reconsideration of interests and goals fifth. Academic failure was eighth in major reasons for the girls, with pregnancy or "tired of being a student" at the sixth and seventh places.[40]

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[38] *Beyond High School*, p. 134. The American Council on Education *National Norms for Entering College Freshmen, Fall, 1967*, p. 33, show that of all entering fulltime college freshmen, 8.6 percent reported a "major concern about financing education" (student not certain he will be able to complete college), 57 percent "some concern" (will probably have enough funds), and 34.4 percent no concern about financing their education.

[39] *Beyond High School*, chapters V and VIII. But the withdrawals and non-attenders did not usually enter a vocational school either, suggesting a general uninterest in postsecondary schooling of any kind.

A study of student withdrawals from the University of California at Berkeley yielded results useful for evaluation of dropouts from a relatively select student body—the upper 12.5 percent of high school graduates. Discrimination between students who drop out with failing or passing grades is important, since 36 percent of those male dropouts with passing grades returned to the university, but only 12 percent of the academic failures returned. Among women the percentages are 27 percent and 6 percent. At Berkeley, academic pressure and dismissal was the leading reason for withdrawal by both men and women. Lack of interest in their studies, financial difficulties, and feelings of loneliness and isolation were second, third, and fourth ranked reasons for the men. Marriage was the second most important reason for the women, feelings of loneliness and isolation were third, and desire to travel or interrupt education, fourth. Discrimination between actual dropouts and transfers must also be made, since all but 19 percent of the students who left Berkeley were enrolled at the university or another institution as of the time they would have normally graduated.

The authors of the Berkeley dropout study also examined relationships between type of residence and dropping out, and discovered that living at home presented particular problems. Twenty-two percent of the Berkeley freshmen lived at home and had a 68 percent dropout rate. Controlling for ability may have made this statistic less astonishing, but the students represent the top 12.5 percent of their high school class and presumably are able.[41] A low family income is probably the chief reason so many of these students lived at home.[42]

Bringing these students into residence at the university probably would decrease the rate of withdrawal. There is a clear implication here for the community colleges, since these schools usually do not have residential facilities.[43]

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[40] "Attrition Among College Students," p. 62.

[41] In practice, the cutoff point in high school class rank seems to be lower than the official 12.5 percent. Hansen and Weisbrod state that 19 percent of high school graduates are eligible to enter The University of California. See W. Lee Hansen and Burton A. Weisbrod, "The Distribution of Costs and Direct Benefits of Public Higher Education: The Case of California," *The Journal of Human Resources*, Spring 1969, pp. 176–191.

[42] The *SCOPE* survey of high school students found that 31 percent of the seniors of each sex *expected* to live at home while in college, but that only 20 percent of the boys and 17 percent of the girls *wanted* to live at home while in college.

The Berkeley student body, being a relatively select group, is not widely typical of students throughout American colleges and universities. The reasons for college withdrawal advanced by Trent and Medsker in their study are likely to be much more representative. These authors found that persisters in college tended to choose a college for its academic reputation whereas dropouts had more tendency to report incidental reasons for college selection. Also the persisters studied, on the average, many more hours per week than the withdrawals. Hours of part-time work per week did not discriminate between persisters and dropouts. The persisters, both before and after entering college tended to show more ability, more interest in college, and more intellectual disposition and academic motivation than the withdrawals. This was even more true the longer they remained in college. The authors were not able to attribute these differences, to any major extent, to ability or SES, and they concluded that the persisters entered college with the necessary predisposition, the state of readiness, to persist and develop in college. Most of the able students in their study, Trent and Medsker feel, who did not enter college or who withdrew did so out of lack of academic orientation and motivation.[44] Since, however, much of the source of such orientation and motivation can be traced to the parents (and as noted earlier to high school peers) socioeconomic status is a significant influence in the presence or absence of this motivation. Strong parental encouragement to enter and persist in college increases as SES increases, even though ability is held constant.

VII. WHO GOES TO GRADUATE SCHOOL?

Attendance at graduate and post-baccalaureate professional schools is increasing, since our highly developed economy requires more and more specialized knowledge and skills. But our concern here is not so much the fact of graduate school attendance, but who goes to them. The Project Talent follow-up surveys allow us to determine the actual probabilities for students who, having received a bachelor's degree, enter graduate or professional schools. Table 18 presents probabilities for graduate school entrance for those students who entered college in the year of high school graduation and who received a bachelor's degree four years later.

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[43] The Berkeley study is by Robert Suczek and Elizabeth Alfert, *Personality Characteristics of College Dropouts,* 1966, and is available through the Educational Research Information Center of the U.S. Office of Education. Some results of this study are reported in Trent and Medsker, *Beyond High School,* pp. 95–96, 117–121, and 151–153.

[44] *Beyond High School,* see Chapters V, VIII, and the concluding chapter. The availability of a college, and of different types of colleges, in the local community (the so-called proximity effects) was highly related to rate of entrance into college, but not to completion of college. For the full discussion of proximity effects see Medsker and Trent, *The Influence of Different Types of Public Higher Institutions on College Attendance. . . .*

TABLE 18.—*Probability of students with bachelor's degrees entering graduate school, by ability and SES*

Ability	Socioeconomic status				
	1 (high)	2	3	4 (low)	Average (actual)
1 (high)	54.0	50.6	41.8	30.5	57.1
2	41.7	40.8	29.4	49.2	24.7
3	43.1	39.6	33.7	17.6	12.2
4 [1]	39.6	25.7	30.2	24.5	4.2
5 (low) [1]	45.8	14.0	33.3	12.8	1.8
Total (average)	48.9	27.4	16.6	7.1	

[1] The number of observations in these cells is very small.

Source: Project Talent, 5-year follow up surveys.

Since the Project Talent survey has followed up the 1960 twelfth and eleventh grade students five years after their high school graduation, and this table is for those college students receiving a degree four years later, these students had one year after college in which to enroll in a graduate or professional school. The probabilities for entrance to graduate school, by both SES and ability, are shown in the cells, and the distribution of students entering graduate school are shown for each ability quintile and SES quartile.

By combining some of these totals we see that about 82 percent of all new graduate students came from the top 40 percent of ability, and more than half (57.1 percent) came from the high quintile alone. If we add the third quintile, 94 percent of all new graduate students are represented. The last two ability quintiles then add only a residual amount of 6 percent. By SES, about 76 percent of all entering graduate students came from the top half of the income scale, with almost half of them from the top quartile alone. A little less than a fourth came from the bottom half of the SES distribution.

The point of most significance here is that while SES is still important in determining who will enter graduate school, ability is somewhat more important. This pattern has been true since the time of entrance to college, where SES exerts its greatest influence.

Table 19 lists the actual numbers of college graduates and entering graduate students for each ability and SES group. The probabilities listed in parenthesis are the same as in the text table just presented, but are rounded to the nearest percent. Overall, 43 percent of the college graduates entered graduate school within a year of college. (At the time of entrance to college, for those students who begin college in the year of high school graduation, the probability is that 25 percent will go on to graduate school, or 1 of every four who enter.)

Figure III shows graphically the probability of entrance to graduate school for the high ability students of all income (SES) levels who have won bachelor's degrees. There is a considerable falling off in attendance, especially for the third and fourth quartiles of SES.

Table 19.—Probability of entrance to graduate or professional school for students with a baccalaureate degree

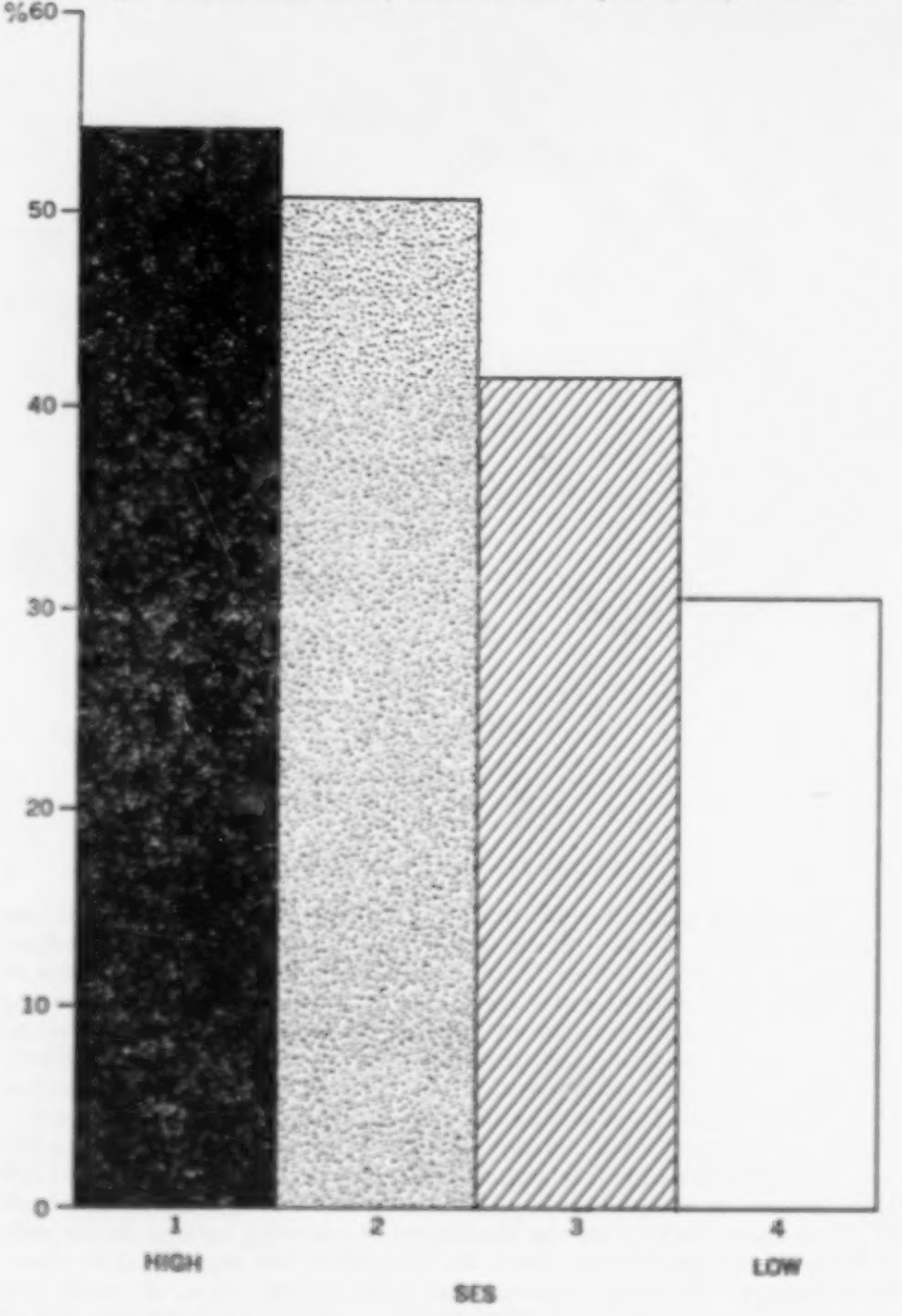
Ability and socioeconomic status	Number college graduates in group [1]	Enter graduate school [2]		Loss	
		Number	Percent	Number	Percent
High ability quintile, (100 to 80 percent):					
1. High	127,000	69,000	54	58,000	46
2.	63,000	32,000	51	31,000	49
3.	63,000	38,000	60	25,000	40
4. Low	14,000	4,300	31	9,700	69
Total	267,000	143,300	54	123,700	46
2d ability quintile (80 to 60 percent):					
1. High	52,000	22,000	42	30,000	58
2.	38,000	15,900	41	22,100	59
3.	30,000	8,700	29	21,300	71
4. Low	15,000	7,300	49	7,700	51
Total	135,000	53,900	40	81,100	60
Subtotal (1-2 quintiles of ability)	402,000	197,200	49	204,800	51
3d ability quintile (60 to 40 percent):					
1. High	24,000	10,000	42	14,000	58
2.	22,000	8,600	40	13,400	60
3.	16,000	5,300	34	10,700	66
4. Low	11,000	1,850	17	9,150	83
Total	73,000	25,750	35	47,250	65
Subtotal (1-3 quintiles of ability)	475,000	222,950	47	252,050	53
4th ability quintile (40 to 20 percent):					
1. High	8,100	3,200	40	4,900	60
2.	8,300	2,150	26	6,150	74
3.	8,100	2,400	30	5,700	70
4. Low	5,400	1,300	25	4,100	75
Total	29,900	9,050	30	20,850	70
Subtotal (1-4 quintiles of ability)	504,900	232,000	46	272,900	54
5th ability quintile (20 percent to 0):					
1. High	2,900	1,300	45	1,600	55
2.	4,200	600	14	3,600	86
3.	3,700	1,200	32	2,500	68
4. Low	5,200	600	12	4,600	88
Total	16,000	3,700	23	12,300	77
Grand total (all ability quintiles)	520,900	235,700	45	285,200	55

[1] 4 years after high school graduation.
[2] By 1 year after college graduation.

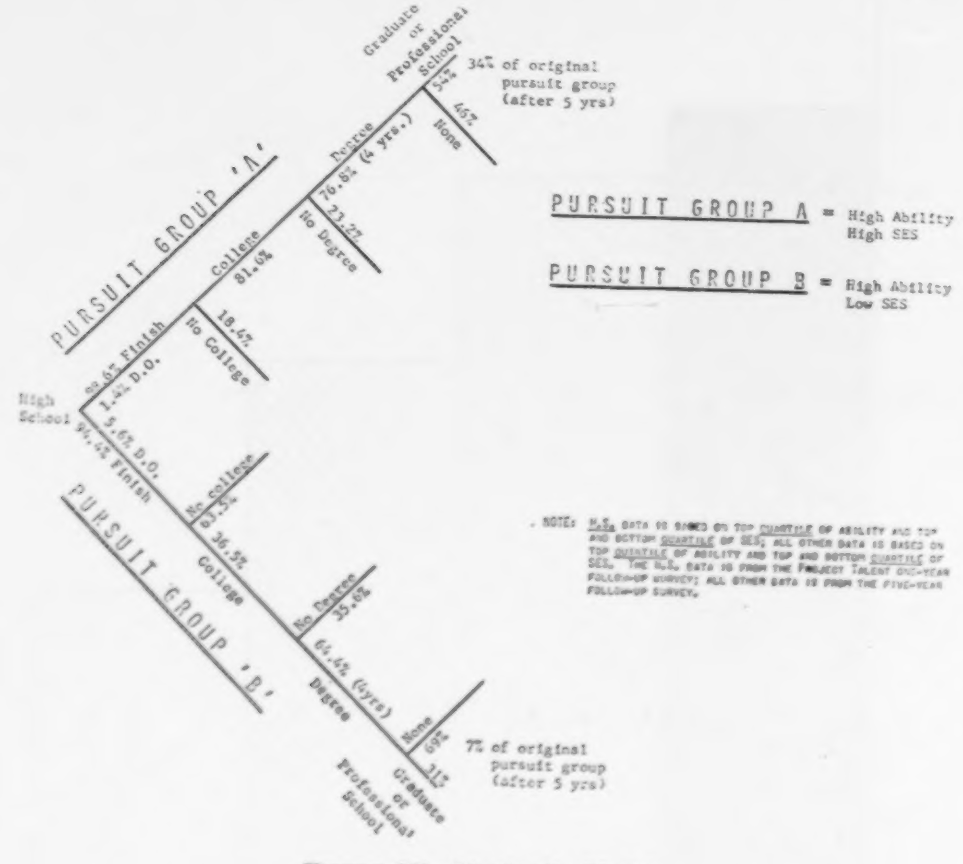
Source: Project Talent, 5-year followup surveys.

FIG. III

Percent of students with a bachelor's degree entering graduate or professional school, by HIGH ABILITY quintile and ALL SES.



More revealing, however, is Figure IV, which presents a stochastic (probability) model, in the form of a tree diagram, of two groups of students. Pursuit group A represents those doubly fortunate students of high ability who are from families of high SES. Pursuit group B


PURSUIT GROUP 'A'
High School
98.6% Finish
1.4% D.O.
College 81.6%
18.4% No College
Degree 76.8% (4 yrs.)
23.2% No Degree
Graduate or Professional School 54%
46% None
34% of original pursuit group (after 5 yrs)
PURSUIT GROUP 'B'
94.4% Finish
5.6% D.O.
No college 63.5%
36.5% College
No Degree 35.6%
64.4% (4yrs) Degree
None 69%
31% Graduate or Professional School
7% of original pursuit group (after 5 yrs)
PURSUIT GROUP A = High Ability High SES
PURSUIT GROUP B = High Ability Low SES

NOTE: H.S. DATA IS BASED ON TOP QUARTILE OF ABILITY AND TOP AND BOTTOM QUARTILE OF SES; ALL OTHER DATA IS BASED ON TOP QUINTILE OF ABILITY AND TOP AND BOTTOM QUARTILE OF SES. THE H.S. DATA IS FROM THE PROJECT TALENT ONE-YEAR FOLLOW-UP SURVEY; ALL OTHER DATA IS FROM THE FIVE-YEAR FOLLOW-UP SURVEY.

FIGURE IV—Stochastic Model

comprises those students of equally high ability but low SES. The tree diagram allows us to pursue these two groups from high school through to graduate school. The probabilities for these two groups of completing high school, entering and completing college, and entering a graduate school are written out on the "limbs" of the tree. This model enables one to quickly grasp the effects of wide variation of SES on students of equally high ability. While at every hurdle more of the low SES students fail to clear the bar, the biggest obstacle is entrance to college, where only 36.5 percent of these students enter college in the year of high school graduation, compared to 81.6 percent of their high SES classmates of equal ability. Thus a student of high ability and high SES has more than twice the likelihood of entering college in the year of high school graduation than his low SES, but equally able, classmate. Some of the latter students will enter college later, of course, but this is also true of the high SES students. When we reach the end of the tree we have only 7 percent remaining of our original pursuit group

B, but 34 percent of group A, the high SES group, is left; this is about 5 times as many as the low SES group.[45]

There are a number of interesting and relevant questions about graduate school attendance that the Project Talent statistics cannot yet answer. One of these is how far these students will go in graduate school and what degrees they will receive. We do know that for all entering college freshmen in 1967, about one-third planned to stop with a masters degree, about 10 percent wanted a Ph.D. or Ed.D., about 5 percent a degree in medicine, dentistry, or veterinary medicine, and 4.1 percent a law degree. Only 0.3 percent wanted a divinity degree and 1.8 percent some other degree beyond the bachelor's.[46] Thus, 51.1 percent of entering *freshmen* in 1967 *planned* on a graduate degree of one sort or another, and 48.9 percent intended to stop with a bachelor's degree or less. This compares to 43 percent of *college graduates* in the Project Talent follow-up survey who actually entered a graduate school within a year of receiving a bachelor's degree.[47]

As to studies of the actual attainment of graduate degrees, there is very little evidence. Most of the longitudinal studies of a student cohort either stop with the bachelor's degree and/or plans for graduate school, or if intending to follow the cohort through the post-baccalaureate years, as Project Talent will do, have not yet had enough time elapse to do so. One longitudinal survey of this subject indicates that most graduate students will not go farther than a master's degree, if they get even that far.[48] This survey revealed that in an 11-year follow-up of 176 graduate students, and of 115 master's candidates in the sample, about 50 percent received a master's degree, 40 percent did not get a degree, and 10 percent went on to a doctorate. Of the 61 Ph. D. candidates in the sample, less than one-third received a doctorate within the 11-year period of the study.

While the Project Talent data presents the relationship between SES, ability, and entrance to graduate school, it does not permit an analysis of the level or kind of graduate degree sought. The table below does show this in relation to family income, but not ability.

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[45] The students would have been in the twelfth and eleventh grades in 1960, and if graduating from college within 4 years would have done so in 1964 and 1965. N. B., Equal ability does not imply equal motivation or equal intellectual predisposition.

[46] The percentages are based on the highest degree planned, whether a graduate degree or lower. The source is the American Council on Education *National Norms*, Fall 1967, p. 30.

[47] There is evidence that the level of aspiration to graduate study is lower at the time of entrance to college than at any other time in the freshman year. A study of entering freshmen at one college has shown that in September the freshmen had much lower plans for advanced study than the non-freshmen. But by November the freshmens' desire for graduate study had sharply increased to a point much closer to the aspirations for advanced study of the other students. This rapid and pronounced growth of interest in graduate school by freshmen indicates that surveys of plans for graduate study of entering freshmen, while accurate at that particular time, may quickly be made misleadingly low by changes in attitude of freshmen as they are socialized by the non-freshmen. See Walter L. Wallace, "Institutional and Life-Cycle Socialization of College Freshmen," *The American Journal of Sociology*, November, 1964, pp. 303–318. Wallace's results suggest that the difference between plans and actual attendance at graduate school is not as small as the data above indicates, except at the time of entrance to college, resulting in a wider gap between plans for graduate study and the fulfillment of those plans than the data just presented above would indicate.

[48] This survey is described in Trent and Medsker, *Beyond High School*, p. 115, and was published in 1964. Trent and Medsker report that for their own sample, a majority of the men who began postgraduate education entered professional schools rather than the academic graduate schools, and that most men and women in the sample did not plan to go beyond a master's degree.

TABLE 20.—*Educational plans—highest degree sought*[1] *(percent within each group choosing each degree goal)*

Educational plans	Below $5,000	$5,000 to $7,499	$7,500 to $9,999	$10,000 to $14,999	$15,000 to $19,999	$20,000 to $24,999	$25,000 and above	Confidential[2]	Don't know[3]
College but less than Bachelor of arts	19.4	17.6	14.9	12.8	12.9	9.8	10.2	15.9	20.1
Bachelor of arts	48.2	47.8	46.6	44.7	44.3	46.1	36.4	43.8	48.5
Master of arts	20.4	22.3	25.8	26.9	23.5	23.9	27.5	22.9	19.2
Doctor of philosophy	3.7	3.0	3.8	4.6	5.1	6.5	4.9	3.7	2.0
Doctor of medicine	1.9	2.6	3.1	3.5	4.7	3.6	7.5	3.9	2.4
Doctor of dental surgery	.4	.8	.8	1.6	2.5	1.0	2.0	1.0	.8
Bachelor of laws	1.3	1.8	2.1	3.0	3.6	4.2	7.5	3.0	1.4
Bachelor of divinity	.5	.4	0.3	.4	.6	.7	.3	.2	.3
Other	3.4	2.8	2.4	2.2	2.5	3.9	3.0	5.1	4.5
Total percent of each group planning training beyond master's degree	7.8	8.6	10.1	13.1	16.5	16.0	22.2	16.8	6.9

[1] This table was prepared from a 3 percent representative sample of 612,000 students tested by the American College Testing Program in 1964 and 1965. This yielded a sample of 18,378 students: 10,073 men and 8,305 women. The table is on p. 19 of *Family Income and the Characteristics of College-Bound Students*, by Leonard L. Baird, Research Report No. 17 of the American College Testing Program, February, 1967.

[2] 6.2 percent of total.

[3] 26.6 percent of total.

What is most significant about this table is the pattern of the lower the family income the lower the student's educational goals, so that below $5,000 only 7.8 percent of these college-bound students anticipated a degree beyond the master's, but 22.2 percent of the students in the highest income group planned such a degree. This pattern is also true of the master's degree itself. More of the lower income students plan to settle for the bachelor's degree or less, than do students with higher incomes. The sharpest differences for educational plans beyond the master's degree are in medicine and law, where the higher income students choose these professions much more often than do low income students.

This table does not allow us to discriminate by ability within family income range, and to compare this with aspirations for particular graduate degrees and programs. Yet we know that the most able students are more likley to choose a career requiring a graduate degree than are the less able. Able students, for example, are more likely to plan careers in scientific research, college teaching, law and medicine than do average students who more frequently choose careers as businessmen or school teachers which do not necessarily require a graduate degree.[49] Career choice, therefore, can cause or retard entrance to a graduate or professional school, and it is no surprise that higher ability students are more likely to aspire to a career requiring a graduate degree. But career choice is highly influenced by SES even though ability is held constant. High ability and high SES students are more likely, as college freshmen, to plan careers as physicians or lawyers than any other ability and SES group, whereas high ability and low SES freshmen are more likely to plan careers as engineers and chemists. Physicists tend to be of high ability but intermediate SES.

Students of low ability and low SES are more likely to plan on occupations as teachers and accountants. Low ability, but intermediate SES students tend to choose careers in business. The most striking fact, however, is that students who could be considered "deviants" from these patterns of career choice, ability, and SES tend to change their career plans to the field where they are more like the other students in ability and SES.[50] In general, students at each ability level have different career plans depending on their SES, and the high SES students usually plan different careers from low SES students of equal academic ability. High SES students are more likely to plan a career requiring a graduate or professional degree than are low SES students of the same ability. Socioeconomic status influences career choice by college students just as much as ability does, and by influencing career choice SES thereby also influences attendance at graduate schools.[51]

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[49] Robert C. Nichols, *The Origin and Development of Talent*, National Merit Scholarship Corporation Research Reports, 1966: Volume 2, Number 10.

[50] Charles E. Werts, *Career Changes in College*, National Merit Scholarship Corporation Research Reports, 1966: Volume 2, Number 7. This study used a sample of 127,000 entering freshmen at 248 colleges; 30,000 of them were followed up one year later to obtain the data on career changes.

[51] For further corroboration of the influence of class on college students' career plans see Werts, *Career Choice Patterns: Ability and Social Class*, NMSC Research Reports, 1966: Volume 2, Number 3.

None of the data presented so far can tell us very much about students' reasons for not entering a graduate school after completion of college. How many students see financial obstacles as a deterrent to graduate school? How many lack the ability or grades? And how many are just plain tired of school after four years of college and are therefore lacking in motivation?

Table 21 lists the reasons for not entering graduate school given by a large sample of June 1961 college graduates who were surveyed in the spring of that year.[52]

TABLE 21.—*Distribution on reasons for not attending graduate or professional school next year*

[Specific reasons—Percent circling item as answer to "Which of the following best explains why you do not anticipate going to graduate or professional school next year?"]

Response	Percent of—[1] Total sample (53,665)	Those not going (36,010)
I want to get practical experience first	22	33
Financial obstacles	20	30
I'm tired of being a student	18	27
Can get a desirable job without further schooling	16	23
No desire to do so	15	22
Family responsibilities	12	19
I would rather get married	8	12
Military service	7	11
Low grades in college	7	10
I will be in a company training program which provides the equivalent	2	4
I don't think I have the ability	2	4
I lack the necessary undergraduate course prerequisites	1	2

[1] Percentages total more than 100 because of multiple answers.

Source: Davis, *Great Aspirations*.

For the total sample in Davis's *Great Aspirations* survey, 31 percent said they would enter a graduate or professional school in the fall of 1961, 45 percent intended to go to graduate school later than fall 1961, and 24 percent indicated they had no plans for graduate school. The Project Talent data (see Table 19) showed 43 percent of college graduates entering graduate school, but this was by 1 year after college, whereas Davis's data is for intended fall 1961 entrance by the previous June graduates. The reasons given out by the seniors for not entering a graduate school in the fall of 1961, or for never intending to enter, fall into two groups: internal, motivational reasons and external obstacles. As Davis points out, "internal motivations appear the more common, 70 percent of those in the 'later' and 'never' categories citing lack of interest or preferring to get practical experience first." Of the external obstacles, financial barriers were the main problem, with 43 percent of those not going on immediately to graduate school citing a financial reason. About one-fifth (18 percent) saw a financial barrier as the *chief* reason for not immediately beginning advanced study. (Family responsibilities often went together with financial obstacles.)

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[52] The table is from James A. Davis, *Great Aspirations*, The Graduate School Plans of America's College Seniors, Chicago, 1964. The sample was drawn from 135 institutions, and was designed to be representative of June 1961 college graduates. The data in this survey is based on a "Total Weighted Sample" of 56,664 cases, but is actually based on 33,982 individual questionnaires.

Socioeconomic status is, as expected, directly related to plans for advanced study. Table 22 breaks out such plans by parental income. (About 13 percent of the college seniors did not know this, a much lower number than reported above for those prospective freshmen surveyed by the American College Testing Program.)

TABLE 22.—*Plans index and socioeconomic status*

Parental income and plans					
Reported annual income of parental family	Next year (percent)	Later (percent)	Never (percent)	Total	
				Percent	Number
Less than $5,000	28.7	52.4	18.9	100.0	9,506
$5,000 to $7,499	31.4	48.0	20.5	99.9	12,954
$7,500 to $9,999	33.0	15.6	21.4	100.0	8,384
$10,000 to $14,999	35.8	40.8	23.4	100.0	7,500
$15,000 to $19,999	35.6	37.7	26.6	99.9	3,089
$20,000 and over	40.4	31.1	28.5	100.0	5,004

NOTE.—Total number, 46,437; don't know income, 6,082.

Source: Davis, *Great Aspirations*.

There is a paradox here: not surprisingly, plans to attend graduate school "next year" increase as parental income increases, and plans to attend "later" increase as family income decreases; but those who say they *never* will go increase as parental income increases! According to Davis, the sons of the "proprietor-manager" group had the largest percentage of seniors who never intended to pursue advanced study, (except in the top ability group, where they were second to the farmers' children). This suggests, Davis feels, "a pocket of upper-class disinterest in advanced study" by the sons of owners who "often do not need a master's degree in business administration to rise in the corporate hierarchy."

Comparing fathers' education with plans for graduate study reveals the expected response of increasing plans as fathers' education increases, and of postponement of graduate study as fathers' educational level decreases. There is more tendency to say "never" about plans for graduate study by the seniors whose fathers hold bachelors' degrees, and Davis believes this to be explained by the paradox just noted.

Table 23 compares plans for graduate school with parental occupation, academic achievement in college, and sex. The pattern in this table is not surprising. The higher the ability and, usually, the SES (parental occupation) the greater the intention of graduate school "next year," with less postponement of plans and less intention never to go. This pattern is also true for the females, and just as females showed significantly less interest in attending college than the males, they also show much less interest, generally, in attending graduate school.[53]

TABLE 23.—*Occupation of head of parental family (father or mother) and plans, controlling for sex and API* [1]

[Number of students, 51,474]

API and parental occupation	Male					Female				
				Total					Total	
	Next year	Later	Never	Percent	Number	Next year	Later	Never	Percent	Number
Top fifth:										
Professional	75.7	19.0	5.3	100.0	1,673	38.3	37.9	23.8	100.0	1,678
Proprietor/manager	66.9	21.9	11.2	100.0	1,372	36.4	44.1	19.5	100.0	1,121
Sales	68.9	20.4	10.7	100.0	383	31.2	40.8	28.1	100.1	292
Clerical	68.2	24.3	7.6	100.1	276	37.4	40.6	21.9	99.9	283
Skilled	64.0	26.9	9.1	100.0	628	38.7	47.5	13.9	100.1	554
Semiskilled	64.4	28.1	7.6	100.1	331	43.9	42.9	13.2	100.0	189
Service	71.1	26.7	2.2	100.0	180	28.3	60.4	11.3	100.0	106
Unskilled	51.9	38.3	9.9	100.1	162	22.7	54.8	22.6	100.1	84
Farmer	50.6	35.7	13.7	100.0	255	17.9	55.9	26.2	100.0	195
Above average:										
Professional	53.7	34.5	11.7	99.9	2,262	27.3	44.0	28.8	100.0	2,575
Proprietor/manager	47.2	33.1	19.8	100.1	2,395	24.2	47.5	28.4	100.1	2,362
Sales	44.7	41.1	14.2	100.0	674	22.1	52.9	25.0	100.0	560
Clerical	46.4	41.9	11.7	100.0	597	22.9	56.9	20.1	99.9	418
Skilled	41.5	45.1	13.5	100.1	1,720	25.7	54.4	19.9	100.0	1,191
Semiskilled	38.6	49.7	11.7	100.0	878	20.2	60.2	19.5	99.9	503
Service	41.1	43.4	15.5	100.0	399	25.1	56.4	18.5	100.0	259
Unskilled	37.0	51.6	11.3	99.9	432	24.3	62.7	13.1	100.1	260
Farmer	36.1	47.2	16.8	100.1	702	11.6	57.6	30.7	99.9	687
Bottom half:										
Professional	28.4	47.9	23.7	100.0	2,743	16.9	47.5	35.6	100.0	1,801
Proprietor/manager	23.9	42.9	33.1	99.9	3,531	15.4	46.3	38.3	100.0	1,716
Sales	23.6	44.8	31.6	100.0	983	14.5	54.8	30.8	100.1	533
Clerical	21.7	51.5	26.8	100.0	761	18.5	48.4	33.1	100.0	399
Skilled	24.5	50.4	25.0	99.9	3,092	19.9	53.7	26.4	100.0	1,273
Semiskilled	22.2	54.8	23.0	100.0	1,392	14.4	68.3	17.3	100.0	624
Service	22.3	54.4	23.3	100.0	566	17.2	50.6	32.2	100.0	267
Unskilled	22.0	54.3	23.7	100.0	822	13.3	55.0	31.7	100.0	278
Farmer	21.6	49.9	28.5	100.0	1,258	9.8	59.2	31.0	100.0	799

[1] API—Academic performance index, which is the basic measure of intellectual ability used by Davis. The API was developed by weighing each student's reported cumulative grade point average in college according to the academic ability of students at his college. The latter was determined by the average score at each college for entering freshmen on the national merit scholarship qualifying test.

Source: Davis, *Great Aspirations*.

Although very few of the seniors indicated their reason for not planning on graduate school was due to lack of ability, low grades, or lacking in course prerequisites (see the list of reasons above), this table reveals that students with lower academic performance were much less likely to plan on graduate school, either "next year" or "later", and were much more likely to say "never." But as already shown, students with low SES origins, while less likely to go "next year" are associated with larger proportions intending to go "later," suggesting an interest in advanced study by these students, but with less opportunity to satisfy their interest. Table 24 introduces broad career types as a variable and confirms some evidence presented earlier.[54]

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[53] Davis points out that the reduced interest in graduate study by females is true also for women with no immediate plans for marriage, and that this difference is primarily motivational and not due to financial or other external barriers.

[54] This table and the three previous tables are taken from Davis', *Great Aspirations*.

TABLE 24.—*Sex, API, and career type by plans for advanced study and reasons for not going on for advanced study (all variables)*

			Plans				Total	
				Later or never				
					Financial obstacles			
Future career	API	Sex	Next year	Motivational reason [1]	Yes	No	Percent	N
Law or medicine	High	Male	89	3	4	4	100	2, 304
		Female	70	11	16	4	101	167
	Low	Male	69	7	10	14	100	917
		Female	42	38	7	13	100	55
Arts and sciences	High	Male	73	14	8	5	100	3, 373
		Female	45	43	11	1	100	2, 723
	Low	Male	37	31	22	10	100	1, 986
		Female	22	59	13	7	101	770
Other	High	Male	40	41	13	7	101	9, 301
		Female	25	62	12	1	100	9, 700
	Low	Male	20	51	17	12	100	11, 566
		Female	16	70	11	3	100	6, 452

NOTE.—Total weighted N, 56,664. Source: Davis, *Great Aspirations.*

[1] Motivation=positive response to one or more items in the "Motivation" cluster or to "Practical experience."

All male seniors planning careers in law or medicine were more likely to enter graduate study "next year" than any other group except the high API male seniors planning study in the arts and sciences. Motivational reasons dominate for those who intend to go "later" or "never", except for the high API seniors of both sexes and the low API males who intend careers in law or medicine, where financial obstacles have a slight edge. This may be because of greater motivation for advanced study by these students, but as we saw earlier, students intending careers in medicine and law tend not only to be of high ability, but also of high SES, thereby being less likely to encounter financial barriers to their plans. The high API males planning on law or medicine cited financial obstacles by 1 percentage point over motivational reasons, with only the high API females who were planning on law or medicine showing a significant degree of financial over motivational reasons. Apparently these students are so strongly career motivated that only external obstacles such as finance can get in their way.

The future career group "other" in Table 24 had the lowest percentage of students planning on graduate study "next year", and these students held rather pronounced motivational reasons for their behavior. This should not be surprising since this group is made up of seniors anticipating careers in business, education, engineering, social work and forestry-agriculture, and as noted earlier it is the lower ability students who more frequently choose careers in these fields (except for engineering), and these students also tend to be low or intermediate in SES.[55]

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[55] The three applied fields of business, education, and engineering alone make up the major fields of about half of all college students; therefore, the much lower rate of plans for graduate school "next year" by this group must greatly depress the overall rate of graduate study for all students.

This category is also likely to contain more graduates who want to get some practical experience before attending graduate school. But in this group even the high API seniors, especially the females, show sharply reduced intentions to go to graduate school "next year."

What can we say then about the extent of talent loss for graduate and professional study? The Project Talent data revealed that about 4 out of 10 of the college graduates actually had begun graduate study within a year of college graduation. How many more of these will also begin graduate study we, of course, do not yet know. About 3 out of 10 of Davis's seniors intended to enter graduate study the fall after their June graduation, with 45 percent intending on advanced study later than fall 1961, for a total of about 75 percent of the June 1961 graduates planning advanced study at some time, with only 25 percent never intending to go. The high API senior men (top fifth) are the most important group for advanced study (Davis feels this can be said without endorsing anti-feminism or intellectual elitism). Davis therefore selected some academic fields and computed the percent of high API men who expected to begin advanced study in these fields the fall after their June graduation.

	Percent
Medicine	98
Biological sciences	92
Physical sciences	86
Humanities	80
Social sciences	76

There is not much talent being lost in medicine and the sciences, but the humanities are losing a fifth, and the social sciences a fourth, of their most able graduates who do not intend immediate graduate study. As Davis says, the figures for the humanities and social sciences are not heartening, but they are not shocking either.

Almost 85 percent of the high API Jewish male seniors in Davis's survey planned immediate graduate study, regardless of SES. Davis suggests that this figure can be used as a norm for immediate graduate study for a highly motivated group, and this norm can be compared with other groups of college seniors. Among the 87 percent of high API male seniors who were not Jewish, plans for immediate graduate study varied from 40 to 78 percent, indicating that much improvement could be made in attendance at graduate school for high ability students in social groups of reduced motivation, or where location (living in smaller cities) restricted opportunity for graduate study. "In particular," Davis notes, "the 61 percent attendance expectations of the low SES, smaller city students (who constitute 22 percent of the high API arts and science men) are disturbing."

By examining the figures given for the high ability quintile in Table 19, support can be given to Davis's assertion that there is room for improvement in attendance at graduate school for high ability students. Table 19 shows that of all the college graduates in this cohort, 49.3 percent (247,000), or about half, came from the top 20 percent in ability. Of this group, 51.4 percent (127,000) were both high SES and high ability, thus the latter students made up one out of four of all college graduates. This pattern of high ability students, and especially high ability, high SES students, dominating the number of college graduates, is intensified when we examine those who begin advanced study. Of the latter, 57 percent (123,000) were of the top 20 percent in ability, and more than half, or 56 percent (69,000), were from the high ability and high SES groups, making up about 32 percent of all entering graduate students. This is not to criticize the predominance of high ability students entering graduate study, but only to point out that there are many higher ability college graduates at all levels of SES who are not beginning graduate study within one year of college graduation.

VIII. COLLEGE ATTENDANCE AND ASPIRATIONS BY NONWHITES

Determining the probabilities for college attendance by ability and socioeconomic status becomes more difficult when race is added as a variable. Social class and race are separate variables and each independently influences educational attainment. For the total population, or for whites only, we can stratify high school graduates by ability, SES, and college entrance, but we cannot do this as yet for nonwhites. Since Negroes make up only 5 to 6 percent of all college students, any national survey of college students will not show enough Negroes to make a meaningful pattern of college entrance by SES and ability. This is true of Project Talent or any of the other large scale surveys that has come to our attention. Nonwhites must either be oversampled or sampled for specifically in order to provide sufficient data for cross-classification by ability and SES.[56]

We do know that in 1967, according to the Current Population Survey of the U.S. Bureau of the Census, nonwhites comprised 12.1 percent of the population, Negroes alone making up 11.1 percent of the total population (11.3 percent of the population 18–24), and Negroes comprised 91.4 percent of nonwhites. The U.S. Office of Education survey of equal educational opportunity in 1965 found that there were about 259,000 nonwhite college students comprising 5.8 percent of all students. Negroes made up about 207,000 of those nonwhite students or 5 percent.[57] In the fall of 1967 there were about 245,000 Negro students or 5.2 percent of all college students.[58]

In the fall of 1968, our most recent data, 84,000 Negro freshmen entered college full-time. (See Table 25.) This figure was about 5.7 percent of all entering freshment in that year. About 43 percent of these freshmen entered predominantly Negro colleges, and this probably represents a declining share of students for the Negro colleges since in 1950 about 60 percent of all Negro students were in Negro colleges; in the mid-1960's about half of all Negro students were in these colleges. The reasons for the decline are various: Negro out-migration from the South, increased integration of formerly all-white colleges, the growth of the two year colleges, etc.[illegible] Many Negroes still attend college in the South, however; the Coleman Report found that 49 percent of all Negro college students in the South and this percentage probably has not gone down very much.

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[56] Since more than 90 percent of nonwhites in the U.S. are Negroes, and since data for other nonwhites is even scarcer, this discussion is limited to Negroes.

[57] James Coleman *et al.*, *Equality of Educational Opportunity*, Washington, U.S. Government Printing Office, 1966. Hereafter cited as the Coleman Report.

[58] Compliance survey of the Office of Civil Rights of the U.S. Dept. of Health, Education, and Welfare, 1968. For an evaluation of the Coleman data see Jencks and Riesman, *The Academic Revolution*, p. 440. It seems reasonable to apply their comments to the Office of Civil Rights 1967 survey also. Jencks and Riesman estimate that Negroes made up 4 to 5 percent of all undergraduates in 1966.

TABLE 25.—*Distribution of Negro and non-Negro entering freshmen, by type of institution, Fall 1969*

Institutions	Distribution of Negro entering freshmen (percent)	Number of Negro students entering	Percent of students by type of institution: Negro	Percent of students by type of institution: Non-Negro	Number of non-Negro students entering
All institutions	[illegible]	[illegible]	5.7	94.3	[illegible]
2-year colleges	[illegible]	[illegible]	4.3	95.7	[illegible]
White 4-year colleges	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Negro 4-year colleges	[illegible]	[illegible]	[illegible]	6.6	[illegible]
Universities	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Source: Adapted from unpublished data obtained from the American Council on Education.

TABLE 26.—*Proportion of Negroes among all 1969 entering freshmen, by institution*

Percent of 1969 entering freshmen who are Negro	Number of institutions	Cumulative percentage
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible] [1]	[illegible]	[illegible]
Total	[illegible]	

[1] These [illegible] institutions are predominantly Negro colleges.

Source: Unpublished data from the American Council on Education.

Table 25 shows that, as already noted, 5.7 percent ([illegible]) of all entering full-time freshmen in fall 1969 were Negro. Forty-three percent entered Negro colleges, about 20 percent two year colleges, and [illegible] percent four year predominantly white colleges and universities. The right hand side of the table shows the percentage of Negro students by type of institution: 4.3 percent of two year college freshmen being Negro, and about 4 percent Negro in the white four year colleges and universities. The Negro colleges are, of course, overwhelmingly Negro, but one should note that the percentage of non-Negro students entering Negro colleges (6.6) is larger than the percentage of Negroes (5.7) entering all institutions.[illegible] The former students are mostly in border state Ne-

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[illegible]

[illegible]

gro colleges. Table 26 is a frequency distribution of Negro entering full-time freshmen at all institutions of higher education in fall 1968. It is apparent from the table that most colleges and universities have very few Negro students: about half of all institutions have from 0.1 to 2.0 percent Negroes and 72 percent have no more than 4.0 percent. If the predominantly Negro colleges and their students are excluded then there is an *average* of only about 22 Negro entering freshmen per institution—if Negro freshmen were divided up evenly among the institutions; this, of course, is not the case, but it does point out that most institutions cannot have many Negro students—there just are not that many at present enrollment levels.

If the number of Negro entering freshmen were to double—and excluding the Negro colleges and their present number of students—this still would only provide about 44 Negro freshmen, on the average, per institution.[illegible] If Negro students were distributed among institutions according to the proportion of the total higher education enrollment borne by each institution (again excluding the Negro colleges and their students), colleges up to 999 students would have only about 4 Negro students among their entering freshmen, institutions with an enrollment of 1,000 to 2,499 students would have 16 Negroes among their entering freshmen, those from 2,500 to 4,999 would have 36, those from 5,000 to 9,999 would have 70, and institutions from 10,000 to 19,999 would enroll 134; institutions 20,000 or above would have 291 Negroes among their entering freshmen. Of course, Negro students in the aggregate do not distribute themselves among colleges and universities in the same proportions as white students, but again the point is clear: it is impossible for most colleges and universities to have more than a handful of Negro students, a few can have many or many can have a few, but the limitations of numbers will prohibit anything else. But what do we know about the socio-economic characteristics and ability of Negro students now in college?

Financial barriers to college are considerably greater for Negroes. The figures below compare student estimates of parental income for Negro and non-Negro entering freshmen in fall 1968.

TABLE 27

(In percent)

Estimated parental income	Negro	Non-Negro
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

Source: American Council on Education.

[illegible] As will be shown in the final section of this paper, doubling the number of Negro freshmen, as of fall 1968, would bring them to about the proportion of white students in the population.

These figures speak for themselves: 55.5 percent of Negro students have parental incomes of less than $6,000, whereas this is true of only 14.2 percent of the non-Negro families; 27.5 percent of the Negro students have parental incomes $8,000 and above, but this is true of 70.4 percent of the non-Negro families. Inferring from the Negro students parental incomes, one would expect these students to show more concern about college expenses, and to be more dependent on non-family sources for financial aid. This is indeed the case:

TABLE 28

[In percent]

	Negro	Non-Negro
Major sources of financial support during freshman year:		
Personal savings or employment	[illegible]	[illegible]
Parental or family aid	[illegible]	[illegible]
Repayable loan	[illegible]	[illegible]
Scholarship, grant, or other gift	[illegible]	[illegible]
Concern about financing education:		
None	[illegible]	[illegible]
Some concern	[illegible]	[illegible]
Major concern	[illegible]	[illegible]

Source: American Council on Education.

The occupations of the fathers' of Negro students are, of course, consonant with their incomes: only 5.8 percent of the fathers are businessmen compared to 31.5 percent of the non-Negro fathers. Although skilled workers comprise about the same proportion of both groups, Negro fathers show a much higher share of semi-skilled workers, 18.7 percent, unskilled workers, 16.5 percent, and unemployed 4.4 percent, than do the non-Negro fathers where these percentages are respectively, 8.2, 3.5, and 1.0. Negro fathers also show generally lower percentages among the professions, with the exceptions of teaching and the clergy.

Educational attainment of the parents of Negro college students shows much greater proportions of "grammar school or less" and "some high school" compared to non-Negro parents, and much lower percentages of college educated parents. This is hardly surprising, of course.

TABLE 29

[In percent]

	Negro	Non-Negro
Father's education:		
Grammar school or less	[illegible]	[illegible]
Some high school	[illegible]	[illegible]
High school graduate	[illegible]	[illegible]
Some college	[illegible]	[illegible]
College degree	[illegible]	[illegible]
Postgraduate degree	[illegible]	[illegible]
Mother's education:		
Grammar school or less	[illegible]	[illegible]
Some high school	[illegible]	[illegible]
High school graduate	[illegible]	[illegible]
Some college	[illegible]	[illegible]
College degree	[illegible]	[illegible]
Postgraduate degree	[illegible]	[illegible]

Source: American Council on Education.

Because of the lack of a comprehensive study of a cohort of Negro high school students followed into the post-high school years, we can say very little about entrance to college, by ability, for Negro high school graduates. The self-reported high school grades of Negro entering freshmen collected by the American Council on Education only permit the broad generalization that the Negro students generally show lower proportions of students, compared to non-Negro students, in the A and B ranges, and higher proportions in the B minus, C and D ranges. The Negro students, however, show up better in high school class rank.

Although far fewer of the Negro students' fathers were businessmen (5.8 percent compared to 31.5 percent for the non-Negro students) more of the Negro students wanted to major in business (20.3 percent) than did the non-Negro students (16.2 percent). Education as a probable major also claimed more Negro freshmen than non-Negroes, and the combined fields of psychology, sociology, and anthropology showed twice as many Negroes as non-Negroes in probable major field. Engineering was the third largest intended major field for non-Negroes (10.1 percent) but was only eighth in rank for Negroes. Whether this is due to a relative lack of numeracy by Negro students, or to a greater interest in the social sciences, business, and education is not known, but Negroes intended to major in mathematics and statistics at a rate (3.7 percent) not much lower than the non-Negro students (4.0 percent). Altogether, business, education, and the three combined social sciences claimed almost half (48.6 percent) of the Negro students for probable major fields.

The Negro students showed a strong desire for graduate study. Significantly fewer Negro freshmen reported a desire to stop with an associate degree (or less than four years of college) or a bachelor's degree only.[61] More Negroes than non-Negroes wanted master's and doctor's degrees (Ph.D. and Ed.D.) than did non-Negroes, but fewer Negroes desired law or medical degrees.[62] Similarly, James Davis, in his study of the graduate school plans of the 1961 college seniors, found that the Negro seniors planned immediate graduate study at about the same rate as the white seniors, and at a higher rate than the disadvantaged white seniors. Almost none of the Negro seniors in Davis' sample reported that they never wanted to attend graduate school. The Negro seniors also reported a much higher percentage of external financial obstacles to graduate study when compared with the white seniors and even when compared with the low SES white seniors. (Only 15 percent of the Negro seniors were from high SES families whereas 54 percent of the white seniors were.)[63]

Anyone who examines the likelihood of college entrance by Negro high school graduates quickly comes upon a paradox: since we know that Negro high school graduates enter college at a rate of at least two-thirds the rate of white high school graduates,[65] why are there so few Negro college students? One obvious answer is the lower rate of high school graduation. Although almost all white and Negro children begin high school, about 1 in 8 Negroes who reach the twelfth grade do not graduate, but this is true for only 1 in 16 whites. Between 1952 and 1962 whites increased their high school graduation rate from 70 to 79 percent, but Negroes only increased from 53 to 56 percent.[66]

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[61] Evidence for the completion of college by Negroes is even harder to come by than entrance, but Jencks and Riesman state that ". . . Negro men seem to be somewhat more likely to drop out of college than white men, while among women the rates are about the same for Negroes and whites." (*The Academic Revolution*, p. 424, f.n.) Jaffe, Adams and Meyers, *Negro Higher Education in the 1960's*, pp. 75–76, feel that the number of Negro college students who will receive the bachelor's degree will be about 40 to 50 percent of those who begin college. This figure substantially agrees, I think, with Jencks and Riesman, and the dropout statistics I have presented earlier.

[62] All the preceding is unpublished data provided by the American Council on Education.

[63] Davis, *Great Aspirations*, pp. 21, 191–194.

Aspiration to college by Negroes is high, and motivation for college does not, on the surface at least, appear to be a problem. As James Coleman observed: "Negroes are especially strongly oriented toward the school as a path for mobility. This finding is consistent with other research that has shown greater aspirations for college among Negroes than among whites of comparable economic levels." [67] Negroes want to excel in school more than any other ethnic group. When asked whether they wanted to be good students, more than half of the Negro twelfth grade students—more than any other group—reported that they wanted to be one of the best students in their class. More Negroes than whites gave this answer in every region of the country in Coleman's survey. Negroes also reported studying after school more than any other ethnic group except the Oriental Americans, and Negroes much less often than whites stayed away from school because of not wanting to come; this was true in every region.[68]

Jaffe and Adams analyzed 1965–66 Census data and largely confirmed Coleman's findings. Negro high school seniors were planning on college more than whites and they reported that this was true because Negro girls planned on college much more often than did white girls.[69] Baughman and Dahlstrom, in their study of rural children in North Carolina, found that the Negro eighth graders reported much more desire to go to college than did the white eighth graders. (Parental attitudes, as reported by the children, showed that the Negro parents favored college for their children slightly more than white parents, but the difference was not statistically significant.)[70]

There is considerable evidence, however, that Negroes are unable to follow through and attain their expectations. Jaffe and Adams reported that Negroes' plans for college were more tentative than those of the whites.[71] Coleman believed that Negro aspirations were unrealistically high, and he found that overall, while Negro and white high school seniors were planning on college at about the same rate, the whites exceeded Negroes on definite plans for college, but the Negroes reported greater numbers of probable plans.[72] As Coleman has succinctly put it: "fewer Negroes have definite plans for college, but fewer have definite plans not to attend".[73] Also, as Coleman's data shows, fewer of the Negro high school seniors reported that they had ever read a college catalog or written to or talked to a college official about going to college.[74]

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[65] Jaffe, Adams, and Meyers, *Negro Higher Education in the 1960's* (pp. [illegible]) state that Negroes enter college at 80 percent of the white rate. This figure is based on 5 of 10 white high school graduates entering college and 4 of 10 Negroes. The white rate probably has increased to at least 6 of 10 in 1968–69 (see Section 9) which would mean that Negroes are beginning college at two-thirds of the white rate. The Negro rate is almost certainly increasing, however, but just how fast is not certain. It would be reasonably accurate to say that Negroes attend college at two-thirds to 80 percent of the white rate.

[66] Jaffe and Adams, *American Higher Education in Transition*, an unpublished summary report of research in progress supported by the U.S. Office of Education, January 1968. Hereafter cited as "Summary Report." Race appears to be unimportant as an influence on high school completion when other variables have been controlled. Blue-collar, big-city Negro males in the North and West, and blue-collar, principally small town and rural southern whites both have unusually high dropout rates from high school. When occupational level (blue-collar-white-collar), residence (South-non-South), and religion (Catholic-non-Catholic) are controlled, racial differences in high school completion largely disappear. See Charles B. Nam, A. Lewis Rhodes, and Robert E. Herriott, "School Retention by Race, Religion, and Socioeconomic Status", in *The Journal of Human Resources*, Spring 1968, pp. [illegible].

Baughman and Dahlstrom, in their study of rural white and Negro children in North Carolina, found that as early as the eighth grade many white boys already wanted to drop out of school as soon as possible. This was much less true for the Negro boys and the girls of both races. See E. Earl Baughman and W. Grant Dahlstrom, *Negro and White Children, A Psychological Study in the Rural South*, New York, 1968, pp. [illegible]. This is a thorough and comprehensive study of all children from kindergarten age through the eighth grade in one rural county of North Carolina. For the Negro children at least this book may be the most complete study of a definable population available.

[67] Coleman Report, p. [illegible].

[68] Coleman Report, p. [illegible].

[69] Jaffe and Adams, "Summary Report." The Negro and white boys planned on college at about the same rate.

[70] Baughman and Dahlstrom, *Negro and White Children*, p. [illegible].

The parents of Negro students showed more interest in their children's education and had higher educational aspirations for their children than did white parents of the same economic level.[75] The parents of Negro first and fifth graders in New York were reported as showing 97 percent desiring college attendance for their children, whereas 89 percent of the white parents reported similarly. The comparison was most striking at the lowest level of socioeconomic status where 96 percent of the Negro parents wished their children to enter college, but only 79 percent of the equivalent white parents wanted their children to attend college.[76]

Both Negro children and their parents hold very high educational aspirations, but they are not able to convert their expectations into actual achievement, thus only about 84,000 Negroes entered college in fall 1968. Even so, there would not even be as many as 84,000 Negro freshmen if it were not for the existence of the predominantly Negro colleges, since if these schools did not exist the students at most of them probably would not be admitted to many of the predominantly white colleges or succeed there if they were admitted. As Jencks and Riesman have pointed out, the aptitude test scores of students at most Negro colleges are lower than the scores at the worst white colleges in the same states. These authors claim that "the typical freshman (at a Negro college) usually performs at about ninth-grade level . . ." and that "a white student with the same aptitude as the typical Negro college entrant has only about one chance in ten of entering college and completing his freshman year in good academic standing".[77] Bereiter and Engelmann feel that the educational attainment level of entering freshmen at the Negro colleges is tenth grade or below.[78]

My purpose is not to criticize the Negro colleges, which have more than enough problems as it is for these colleges have long provided a service when no one else was much interested, but only to point out that were it not for the Negro colleges, many of which take students not likely to enter or succeed at other colleges, the 84,000 Negro entering freshmen is a figure that at first seems small, but is actually, in some ways, large.[79]

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[71] "Summary Report."

[72] Coleman Report, Table 3.13.7.

[73] Coleman Report, p. 278.

[74] Coleman Report, Tables 3.13.8 and 3.13.9.

[75] Coleman Report, p. 302.

[76] See "Race and Social Class as Separate Factors Related to Social Environment", in *The Disadvantaged Child*, by Martin Deutsch and Associates, New York, 1967, pp. 309-317. Further evidence of the very high academic expectations of Negro parents for their children are described in Juffs and Adams, "Summary Report", and see the article by Irwin Katz cited below.

[77] Christopher Jencks and David Riesman, *The Academic Revolution*, New York, 1968, pp. 433-435.

[78] Carl Bereiter and Siegfried Engelmann, *Teaching Disadvantaged Children in the Preschool*, Englewood Cliffs, N.J., 1966, p. 25.

At grade twelve, as Coleman discovered, the average Negro student is about 3¼ years behind the average white student in verbal ability. At every grade, Negroes are about one standard deviation below whites in educational performance.[80] Bereiter and Engelmann, judging from College Entrance Examination Board scores and other evidence, say that among the more seriously disadvantaged groups, such as southern Negroes, the average high school graduate has about a seventh or eighth grade level of achievement in basic subjects.[81] The College Board's Scholastic Aptitude Test (SAT) verbal mean score for all high school seniors is about 375, but only 11.5 percent of Negro seniors would score at or above 375, and it has been estimated that 10 or at most 15 percent of Negro high school seniors would score 400 or more on the SAT-verbal, on a scale of 200 to 800. Only 1 or 2 percent of Negro seniors would be likely to score 500 or more on this test. Compared to white twelfth graders, Negro seniors score 1.2 standard deviations lower on the SAT-verbal.[82] There are probably only about 5,000 Negro high school graduates in 1968 who would meet the entrance criteria of selective colleges under color-blind admissions. By selective is meant those who score 550 or more on the SAT-verbal, with B or better high school grades, and who would be expected to achieve C minus or better grades in a selective college.[83]

Clark and Plotkin, however, have argued that SAT and similar aptitude test scores "do not predict the college success of Negro students in the same way they do for whites." These authors cite the performance of a group of Negro students who generally scored low on the SAT yet who performed in college more successfully than the white students at these (integrated) colleges.[84] There is extensive and very careful evidence accumulated, however, to show that the SAT and similar tests predict Negro students' grades in Negro and integrated colleges just as well as they predict for white students.[85] Cleary, in checking Clark's and Plotkin's data at three of the integrated colleges in their sample, found that the college grades of Negroes and whites were predicted about equally well in two of the colleges, and in the third college the Negro students' grades were lower than predicted.[86]

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[79] The two-year colleges with their open door policy would of course take these students, but these colleges are not yet widespread in the South, and southern Negro students seem to be reluctant to enter them anyway; see Jencks and Riesman, p. 422. There is some evidence that two-year colleges are not attractive to Negroes in northern cities either; for example the new four-year public Federal City College in Washington received 4,000 applications, but the equally new public two year Washington Technical Institute received only 600 applications. Both these institutions have almost entirely Negro student bodies. The City University of New York has decided to establish a four-year college (which will have some two-year programs) rather than a two-year college in the largely Negro Bedford-Stuyvesant area of Brooklyn.

[80] Coleman Report, p. 273.

[81] Bereiter and Engelman, *Teaching Disadvantaged Children*, p. 4.

[82] See S. A. Kendrick, "The Coming Segregation of Our Selective Colleges", in *The College Board Review*, Winter 1967-68, pp. 6-13.

[83] This is an estimate from data provided in Kendrick's article.

[84] Kenneth B. Clark and Lawrence Plotkin, *The Negro Student at Integrated Colleges*, New York, 1963. As Kendrick has pointed out, however, Clark's and Plotkin's "data do not distinguish among students attending very selective and unselective institutions, and it is impossible to tell whether the students did or did not do just what would have been expected of any students at the particular colleges attended".

[85] See Julian C. Stanley and Andrew C. Porter, "Correlation of Scholastic Aptitude Test Scores with College Grades for Negroes versus Whites", *Journal of Educational Measurement*, Winter 1967, pp. 199-218. Also see Kendrick.

[86] T. Anne Cleary, "Test Bias: Prediction of Grades of Negro and White Students in Integrated Colleges", *Journal of Educational Measurement*, Summer 1968, pp. 115-124.

Why, then, do Negroes hold such high educational aspirations when these aspirations seem to be so unrealistic? One answer appears to be the fact of racial isolation itself.[87]

In their comprehensive study of rural Negro and white children in North Carolina, Baughman and Dahlstrom found that the Negro children in the eighth grade had positive self-concepts and these were reflected in their very high educational aspirations. (The white children had slightly less positive views of themselves, but they did not aspire to go to college nearly as much.)[88] The authors believe that the Negro children's aspirations were not set without reference to their own experiences. The Negro children who aspired to college had significantly higher IQ's and achievement test scores relative to their own group. (The schools in this study were still largely segregated by race in 1961–1964 when most of the data was accumulated.) Many of these children had achieved relative success compared to their peers in class and these successes appear to have generated self-esteem. Within race, the children who aspired to college showed significantly higher scores on the Stanford-Binet IQ Test and the Stanford Achievement Test than those who did not want to go beyond high school; but the differences between races of those who aspired to college were just as pronounced. As these authors point out, an IQ of 95 may not seem to be modest if a child is competing against children whose average ability level is much lower, and as a result such a child may hold unrealistic educational ambitions.[89] As Irwin Katz has suggested, ". . . in predominantly Negro schools where low attainment levels prevail, most pupils should be largely incapable in the absence of external cues of realistic self-appraisal . . . ."[90]

TABLE 30.—*Stanford-Binet IQ's and Stanford achievement test scores of 8th-grade children with 2 different levels of educational aspiration*

Group and educational goal	Mean S-B IQ	Mean SAT (grade equivalent)
White boys:		
High school	96.6	5.1
College	122.6	9.0
White girls:		
High school	96.7	7.6
College	107.4	9.2
Negro boys:		
High school	76.0	4.9
College	86.8	6.1
Negro girls:		
High school	80.1	5.5
College	87.6	6.6

NOTE.—N equals 225.

SOURCE: Adapted from Baughman and Dahlstrom, *Negro and White Children*, table 16.14.

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[87] Education appears to be the most important determinant of prestige among Negroes, more so than either occupation or income or anything else. Among whites, however, occupation and income appear to be at least as important as education and perhaps more so. A college degree brings a larger increment of occupational prestige to Negroes than to whites even though, in general, Negro college graduates have had a lower occupational status than white college graduates. See Norval D. Glenn, "Negro Prestige Criteria: A Case Study in the Bases of Prestige," *The American Journal of Sociology*, May 1963, pp. 645–657.

[88] *Negro and White Children*, pp. 443, 445. Self-concept was determined by asking the child about the happiness of his homelife compared to others and how satisfied the child was with himself.

[89] *Negro and White Children*, pp. 446–447.

[90] Irwin Katz, "Academic Motivation and Equal Educational Opportunity", *Harvard Educational Review*, Winter 1968, pp. 57–65.

Table 30, adapted from Baughman's and Dahlstrom's *Negro and White Children*, illustrates the validity of Katz's hypothesis. Note that the IQ scores of the white children who do not aspire to college are low, but they are about the same as the Negro children who want to go to college. The achievement test scores for the Negro children aspiring to college are about two and a half years below the grade equivalents for the white children who wish to attend college.

The positive self-concept of the southern rural children in Baughman's and Dahlstrom's study is not limited to rural or southern disadvantaged children. Soares and Soares have recently demonstrated that a group of disadvantaged children in a northern industrial city (apparently Bridgeport, Conn.), who were largely Negro and Puerto Rican and attended a neighborhood, de facto segregated school (one-third white disadvantaged), had positive self-perceptions that were at least as high as the children attending a largely white (90 percent) school in the same city who were middle-class.[91]

Disadvantaged children, therefore, whether northern or southern, urban or rural, do not necessarily have low self-esteem or a poor sense of personal worth. They do not, consciously at least, feel deprived, even when segregated. As Katz has pointed out, it may well be due to segregation that they have a sound self-concept since these children lack external yardsticks to compare themselves, and thus they are not aware of their low educational attainment. The relatively successful Negro children, as Baughman and Dahlstrom have shown, held educational aspirations that are unrealistic compared to objective standards. The parents of these children, as seen above, tend to have very high educational hopes for their children, also leading the children to aspire to scholastic excellence and college. Why then do so few of these children succeed in high school and enter college? Why do so many of these chilren fall along the way and become unable to attain their high aspirations?[92]

One very important reason may be that while consciously the Negro children do not feel deprived, and have sound self-concepts, unconsciously they may have a distorted view of themselves. The authors of *Negro and White Children* wondered if the pronounced discrepancies between the abilities and achievement of the Negro children and their stated educational goals were reflecting serious distortions of self-perception and insight. Since all the eighth grade children were given the Minnesota Multiphasic Personality Inventory (MMPI) we can gain insight into the minds and emotions of these children in a way that is not possible with Coleman's survey.

The evidence acquired by use of the MMPI indicated a considerable degree of emotional disturbance in the Negro children, particularly the boys.[93] In general, the Negro children described themselves, through their MMPI profiles, in terms of estrangement and cynicism; estranged because the future to them seemed hopeless and they believed they would get a raw deal from life; cynical because, for example, they felt that people would usually lie to get ahead. The Negro children, compared to the white, showed less optimism or less expectation of successful outcomes to their undertakings. The Negro boys in particular were likely to exhibit poor morale and a pessimistic outlook.

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[91] Anthony T. Soares and Louise M. Soares, "Self Perceptions of Culturally Disadvantaged Children", *American Educational Research Journal*, January 1969, pp. 31–45.

[92] I ignore here any question of quality of schooling, not because schools are unimportant, but because they may be less important than family and other environmental factors. See footnote 34.

This sense of estrangement and cynicism is very similar to one of the three attitudinal variables measured by Coleman, who also attempted to relate them to scholastic achievement. Coleman found that of the three attitudinal variables used in his survey (self-concept as regards ability, interest in school work, and sense of control of environment—for control of own rewards), sense of control of environment was the most important for disadvantaged children and the most related to school achievement. If the children believed they could influence their environment so that it would respond to their own efforts they were much more likely to succeed in school, but if they felt the environment was immovable and their own efforts could not affect it, then, they were less likely to achieve in school.[94]

The Negro children studied by Baughman and Dahlstrom with the MMPI also had many problems of identity, personal and social alienation, and, at bottom, had doubts about their own worth and competence. The Negro children, however, had higher scores on the MMPI in their intellectual and cultural interests compared to the white children, and this result agrees with the strong educational aspirations of these children as already described. By the time the children had reached the eighth grade, the authors point out, their self-reports through the MMPI already show the kinds of attitudes, beliefs, and self-perceptions that different[illegible] Negro and white adults.[95] This conclusion is borne out by a study of a group of Negro and white adults in a central Florida city where about two-thirds of the Negro adults were found to be alienated and estranged, but most of the whites were not. More than half of the Negroes, but only 16 percent of the whites, had a sense of normlessness: a feeling of cynicism, pessimism, with perceived conflicts between success goals and ethical means of obtaining them.[96] I find these observations supportive of the results of Coleman and Baughman and Dahlstrom.

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[93] The MMPI findings indicated that, as a group, the children of both races showed poor control, impulsiveness, lack of self-confidence, insecurity, alienation and crisis in personal identity. But the Negro children, especially the boys, showed these traits to a much greater degree. Also, most of the children in this study are lower class, and lower class children in general show more disturbance on the MMPI than middle and upper class children. See chapter 11 of the book. Arthur Jensen believes that emotional disturbances combined with severe environmental disadvantages best explains the "bulge" in the 70 to 90 range of the IQ distribution in the population. Mild subnormality in IQ (70 to 90) "is virtually confined to the lower social classes" according to Jensen. His conclusions support Baughman's and Dahlstrom's findings with the MMPI and the Stanford-Binet IQ test for the Negro children. See Arthur R. Jensen, "How Much Can We Boost IQ and Scholastic Achievement?" in *The Harvard Educational Review*, Winter 1969, p. 27.

[94] The importance of these attitudinal factors should not be underestimated: Coleman found that these three attitudes showed the greatest relation to achievement, at grades 6, 9, and 12, of all the variables measured in his survey, including all measures of family background and all school variables. See pp. 319 to 325 of the Coleman Report.

[95] See chapter 11 of *Negro and White Children* for the discussion of the eighth grade children as assessed by the MMPI.

Why did the emotional disturbances of the Negro children, particularly the boys, which were so pronounced on the MMPI, not show up in the children's behavior? Baughman and Dahlstrom believe that there was underlying disturbance, but that the relatively stressless and placid life in "Millfield" does not reveal the underlying pathology. If the children were transplanted to a more complex environment—a large city—then "overt behavior pathology among them would become much more prevalent . . ." Indeed, the authors cite some evidence that this is true.[97]

The sources of this disturbance doubtless are multiple and complex. It is true that the Negroes showed more disturbance on the MMPI, and the Negro boys much more, but the environmental pressures on Negroes are more intense, and boys are known to be more sensitive to the environment than girls.[98]

Irwin Katz has hypothesized that the high levels of anxiety he has found in Negro school boys are often induced by their parents. Early results of Katz's investigations have so far borne out his hypothesis. Katz's study of Negro boys in a northern city point to the very high demands made by Negro parents for academic achievement as an important source of anxiety in these children.[99] The high educational aspirations of Negro parents for their children are often in the nature of wishful fantasies, in the sense that the parents do not know how to implement their aspirations for their children—unlike many middle-class families.[100] But these aspirations have consequences in that they are conveyed to the boy as expectations he is supposed to fulfill.

Katz believes that the "typical" lower class Negro mother tries to socialize her child for scholastic achievement mostly by establishing rules about class conduct and punishment for transgressions,[101] but the mother is not sufficiently able to "guide and encourage her child's efforts at verbal-symbolic mastery." [162] The child has internalized the values and goals of academic achievement and interest but he has not internalized "the behavioral mechanisms requisite for attaining them". The child's inability to attain his internalized scholastic values and goals explains why the low-achieving Negro boys are so anxious and critical of their own efforts rather than easily satisfied or not caring.

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[96] Russell Middleton, "Alienation, Race, and Education", *American Sociological Review*, December 1963, pp. 973–977.

[97] See pp. 469–470 of *Negro and White Children*.

[98] See Jensen, "How Much Can We Boost IQ and Scholastic Achievement?", p. 22, citing the work of Nancy Bayley.

[99] Irwin Katz, "Academic Motivation and Equal Educational Opportunity", *Harvard Educational Review*, Winter 1968, pp. 57–65. Early in his researches, Katz discovered that the Negro girls showed less indications of anxiety and he temporarily dropped them from his investigations.

[100] For further evidence that the high educational hopes of the parents of urban ghetto children are often in the nature of fantasy, see: Suzanne Keller, "The Social World of the Urban Slum Child: Some Early Findings," *American Journal of Orthopsychiatry*, October 1963, pp. 823–831.

[101] Both Negro and white working class mothers of grade school children have been found to prefer an authoritarian teaching style in school. The mothers preferred a teacher who was most concerned with emphasizing adult authority, maintaining discipline, and seeing that the children worked hard and followed directions. Any deviation in this preference tended to be in the direction of content-oriented teaching but still with an authoritarian style. Middleclass mothers, however, tended to prefer a permissive teacher who made the classroom interesting and who encouraged the children to be creative and figure things out for themselves. See Sam D. Sieber and David E. Wilder, "Teaching Styles: Parental Preferences and Professional Role Definitions," *Sociology of Education*, Fall 1967, pp. 302–315. Working class parents place far greater stress on obedience and on conformity to external proscriptions by their children than do middle class parents who place more importance on self-direction. These differences in parent-child relationships apparently originate in the occupational differences between the working and middle classes. See Melvin L. Kohn, "Social Class and Parent-Child Relationships: An Interpretation," *The American Journal of Sociology*, January 1963, pp. 471–480.

In order to reduce the anxiety brought about by his predicament the child becomes self-critical and self-discouraging. As a way out of his dilemma the child is "socialized to self-impose failure," he internalizes self-discouragement as a means of reducing stress caused by inability to satisfy high academic goals. The stress is increased, according to Katz, by the low rewardingness and punitiveness from the parents who socialized the boys toward these goals in the first place, but are not able to help him attain them.

As we have seen, the Negro children and parents in Baughman's and Dahlstrom's "Millfield" had unrealistically high educational aspirations, considering the academic retardation of these children. The degree of disturbance exhibited by the Negro boys on the MMPI seems to have been caused in part by the anxiety and stress brought about by holding high academic goals and high educational interest (also evident on the MMPI) but an inability to attain these goals. Katz, therefore, has proposed a "substitute-value" hypothesis: "When high standards are adopted, but not the behavioral mechanisms necessary for attainment, the relationship between verbal expressions of the standards and actual performance will tend to be an inverse one." This hypothesis seems likely to be a major reason why more Negroes are not able to succeed in school and enter college. This hypothesis also helps us to understand why there is such a large gap between aspirations and achievement.

There is still the question of whether we can actually attain true equality of educational opportunity, and how close we may already be to it.

IX. IS OPPORTUNITY FOR HIGHER EDUCATION INCREASING?

As described in section 3, the Project Talent data showed us that about 4 in 10 high school graduates entered college in the year they completed high school, and about 5 in 10 will have entered college within 5 years of high school. Other studies of enrollment trends were cited to show that this pattern has been true for a long time. The growth of the two-year colleges has altered this pattern in very recent years.

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[162] Baughman and Dahlstrom, Negro and White Children, pp. 209 and 462, describe the spontaneous comment made by a Negro mother to one of their field workers: "she did not know how to read to her child until she saw one of our staff members doing this."

Although the ratio of college enrollment (degree-credit) to the population age 18-21 has increased from .28 percent in 1955 to .41 percent in 1967, the ratio of first-time opening fall degree-credit enrollment to high school graduates of the same year has not increased as much. In 1955 this ratio was .50 and in 1960 it was still .50. For 1967 the ratio increased to .54—a rise of about one half of one percent a year since 1960.[103]

Analysis of recent Census data has shown that between the early 1950's and 1967 there has been a gradual, steady increase in college entrance by high school graduates from about 9 in 20 (45%) to 11 in 20 (55%). When only immediate entrants to college are included, then in 1960 about 4 in 10 high school graduates entered college and about 5 in 10 by 1966. When delayed entrants are added, then about 6 in 10 of the 1966 high school graduates will eventually enter college.[104] These results approximately agree with Project Talent and the American Council's calculations cited above.

Jaffe and Adams attribute the recent increased proportion of high school graduates beginning college to the increase in enrollment at the two-year colleges. Similarly, Campbell and Siegel attribute to the two-year colleges the recent proportional increases in college entrance for eligible students.[105] Entrance to the two-year colleges seems to be primarily a function of their availability—the so-called proximity effect. But while the availability of a two-year college in a community is definitely related to the rate of college entrance, it has not increased the rate of college completion.[106] Jencks and Riesman have pointed out that a network of community colleges "does increase the proportion who enter college, but it does not appear to increase the proportion who earn B.A.'s". These authors generalize from the California experience which, with its very extensive system of two-year colleges, does get most of its high schol graduates into college, "but it is no more successful in getting them through four years than States like New York and Massachusetts". While the presence of a community college provides a route to the bachelor's degree for students who might not—for whatever reason—have been able to go on to do so, the failure of these colleges, according to Jencks and Riesman, to make a significant increase in the proportion winning bachelors' degrees "suggest that this must be a small group".[107] This conclusion is more striking when we realize that most students enter two-year colleges intending to go on to the bachelor's degree.[108]

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[103] *A Fact Book on Higher Education*, American Council on Education, Washington, 1969, pp. 9006–9007, and *Projections of Educational Statistics to 1977–78* (1968 Edition), U.S. Office of Education, Washington, Government Printing Office, 1969, Table 5.

[104] Jaffe and Adams, "Summary Report."

[105] Jaffe and Adams, "Summary Report" and "Trends in College Enrollment"—see footnote 2; for Campbell and Siegel also see footnote 2.

[106] See Medsker and Trent: *The Influence of Different Types of Public Higher Institutions on College Attendance from Varying Socioeconomic and Ability Levels*. Also see *Beyond High School* by the same authors.

[107] Jencks and Riesman, *The Academic Revolution*, pp. 489–490.

Thus the two-year colleges have succeeded in getting proportionally more students into college but they have not increased the proportion earning a bachelor's degree. When ability and socioeconomic status are controlled, men who enter two-year colleges are less than half as likely to win a bachelor's degree as are equivalent men who enter four-year colleges. For both men and women, and considering only the top 40 percent in ability, the proportion of two-year college entrants who have attained a bachelor's degree is less than half that of those students of the same ability who entered four-year colleges. Therefore, while the two-year colleges have increased the chances for college entrance, and they have been more successful in getting low SES students into college, these colleges may actually be increasing socioeconomic differentials in college completion since they have not increased chances of attaining a bachelor's degree accordingly.[109] As Jencks and Riesman have put it: "Most of their students enter with the conventional desire for a union card, flounder for a year or two, and then dropout".[110]

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[108] National figures for associate degrees and awards for completion of chiefly occupational programs are available only for 1965–66 and 1966–67. (See *Associate Degrees and Other Formal Awards Below the Baccalaureate, 1965–66 and 1966–67,* U.S. Office of Education, Washington. Government Printing Office, 1969.) In fall 1966 total junior college enrollment was 1.33 million (92 percent public). Seventy-two percent (958,000) was degree-credit enrollment and 28 percent (373,000) was in chiefly occupational programs. In 1967, 119,000 associate degrees were awarded and 88,000 one- and two-year occupational awards (73,520 two-year and 14,561 one-year). (These are awards not students since the associate degrees and two-year occupational program awards are not mutually exclusive.) No more than 207,000, and perhaps much less, received an award or degree of the 1.33 million two-year college students. From these figures it is apparent that most students in two-year colleges do not complete either transfer or occupational programs. This observation is supported by Burton R. Clark in *The Open Door College,* pp. 64 and 77, where Clark points out that very few students completed occupational programs in one typical California community college. (The above enrollment figures are from *Opening Fall Enrollment,* 1966, U.S. Office of Education, Washington, Government Printing Office, 1967.) What is not known is how many junior college students transferred to a four-year college without receiving an associate degree. Clark states that the average stay of transfer students in the community college he studied was 1.2 years before transferring. Reportedly, the University of California and the state colleges are now encouraging transfer students to remain in the junior college two full years before transferring as an economy measure. (Personal communication with the office of California Community Colleges.) This should increase the number of sophomores in the community colleges therefore, but California junior college enrollment figures presented earlier in section 6 show that there has been very little change in the proportions of freshmen and sophomores in the two-year colleges between 1965 and 1968. This suggests that Clark's observations were not generally true for all community colleges in California or true only at that time—1960, and that the extent of transfer to the state colleges and university before completing two years is small.

The probabilities of an entering freshman in a California public junior college becoming a sophomore and of receiving an associate degree or a two-year occupational award are quite small. A freshman has about 4 chances in 10 of becoming a sophomore, and about 4 in 10 of receiving an associate degree or two-year occupational award if he does reach the sophomore year. The entering freshman has less than 20 chances out of 100 of receiving an associate degree or a two-year occupational award. This does not take into account the one-year occupational awards, of which there were only about 5,000 in 1967, or those who may transfer to a four-year college before completing two years, but as already suggested the latter figure is probably small. Even so, the probabilities given here should only be regarded as rough approximations. These probabilities were calculated from the award source noted above and the enrollment figures given in *Junior College Active Enrollments,* Spring 1967, California Community Colleges, Sacramento, 1967.

[109] See John K. Folger, Helen S. Astin, and Alan E. Bayer, *Human Resources and Higher Education,* chapters 5 and 10, forthcoming, by the Russell Sage Foundation.

[110] *The Academic Revolution,* p. 490.

About 11 in 20 (55 percent) of high school graduates are now entering college, as noted above, and we can expect that at least 12 in 20 (60 percent) will enter from very recent high school classes when the delayed starters enter. The remaining question is how far can we expect to go? What is the likely "ceiling" on the proportion of high school graduates who will enter college? Earlier in this paper (section 3) I pointed out hat if all high school graduates of a given ability level entered college in the same proportion as did high school graduates of the top SES quartile for that ability level, this would have increased college entrance to about 69 percent of the 1965 high school senior class, or from 5 in 10 to 7 in 10. Since about 55 percent of recent high school classes have entered college, and as Jaffee and Adams have indicated, at least 60 percent of the high school class of 1966 will have entered college when delayed starters are included, we are not far from the hypothetical "ceiling", imposed by the various combinations of SES and ability, of about 7 in 10 high school graduates beginning college.

If we add those graduates who enter noncollegiate post-secondary vocational training, then we may expect about 80 percent of all high school graduates to at least begin some sort of post-secondary education or vocational training. The remaining 20 percent of high school graduates will comprise the significant number of girls who marry right after high school, boys who just want to go to work, begin an apprenticeship, or enter the armed services.[111] Thus we are probably with 10 percent of achieving our hypothetical ceiling of 70 percent of high school graduates at least starting college. Based on the number of high school graduates in 1968 (2.70 million) we could expect a remaining increase of 270,000 high school graduates who would have entered college if the ceiling had been attained. This is the difference between 60 and 70 percent of the 1968 high school class entering college. (This would have meant an increase of 108 more freshmen , on the average, at the existing 2,500 institutions.)

There are indications that we may be close to our hypothetical college entrance ceiling for white male high school graduates, but not for white female or Negro high school graduates. Recently published census data shows that 63.2 percent of white male high school graduates in 1968 were enrolled in college by October of that year.[112] This does not include those 1968 graduates who were enrolled in noncollegiate postsecondary schools. Taking into account the large number of high school graduates who delay entrance to college and those in noncollegiate postsecondary schools, then the eventual proportion of 1968 white male high school graduates who enter college on other training after high school probably will be at least 70 percent.[113]

Although slightly less than half (48.9 percent) of the 1968 white female high school graduates entered college in 1968, there will still be delayed entrants to college (much less than for men, however) as well as those who enter noncollegiate postsecondary schools (nursing, business, etc.). Of the women who graduated from high school in 1968, but who did not begin college, almost one-fifth (18.5 percent) were married by October of that year—this is almost 10 percent of the total number of women high school graduates in 1968. It is not realistic to consider these married women as "losses" to college since less than half of them (47.4 percent) were in the civilian labor force in October 1968.

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[111] See the discussion of these reasons in section 4.

[112] Vera C. Perrella, "Employment of High School Graduates and Dropouts," *Monthly Labor Review*, June 1969, pp. 36–43.

[113] Since first time opening all enrollment in 1968 was 1.9 million, and 1.44 million of these were 1968 high school graduates, then about 456,000 entering freshmen in fall 1968 were high school graduates prior to 1968—this is 23 percent of those who entered college in fall 1968. These calculations are derived from the census data cited above and *Opening Fall Enrollment in Higher Education 1968: Part A—Summary Data*, Government Printing Office, Washington 1969.

There is the problem of dropouts from high school still to consider. Can we expect large numbers of additional students to enter college when and if dropouts from high school are reduced to an insignificant number? The answer appears to be no—at least for whites. In 1967–68, 78 percent of all the 1964 ninth graders graduated from high school (almost all school children—97 percent—reach the ninth grade).[114] By referring to Table 1 we can see that most students who do not complete high school are from the lower half of the ability scale, particularly the bottom quartile, and that high school non-completion from the top half of the ability scale is relatively small. It is not likely that large numbers of these students could realistically aspire to college, especially success in college, even if they were to finish high school.

For Negroes, about 6 in 10 were completing high school in 1968.[115] By the 1960's almost all Negro children were reaching high school, so that any further increases in high school completion for Negroes must come from increases in the school retention rate.[116]

While no statistics are collected on the actual number of Negroes who graduate from high school each year (these figures are collected by the U.S. Office of Education only by totals) it is possible to estimate the number. There were 3.5 million total population age 18 in 1968, and Negroes comprised 12.6 percent (443,000) of the population of this age.[117] We know that about 6 in 10 Negroes were graduating from high school. (Of Negroes 25 to 29 years of age in 1968, 56 percent had completed high school. In 1968 the median years of school completed for Negroes age 20 to 24 was 12.2 compared to 12.8 for whites. The gap appears to be rapidly closing. See "Educational Attainment: March 1968"). There were, therefore, about 266,000 Negro high school graduates in 1968. (443,000 × 60.0 = 265,800.) Since slightly over 84,000 Negroes began college in fall 1968 then about 31.1 percent of 1968 Negro high school graduates entered college in that year.[118] This figure represents only full-time students. Allowing for part-time students—22 percent of all entering freshmen in 1968—would increase this number to 108,000 or 40.6 percent of 1968 Negro high school graduates beginning college in fall 1968. This assumes that Negroes entered college in the same proportions of full-time and part-time that white students did in 1968. This assumption may be groundless, but it is very possible that Negroes attend college part-time in greater numbers than whites which, if true, would mean that *more* than 40.6 percent began college in 1968.

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[114] See *Fact Book*, pp. 9048 and 9050. By state, high school completion varies from (in percent) 63 in Georgia to 92 in Minnesota. In the most populous states completion ranges from 70 in Texas to 87 in New Jersey. Of the total population 22 to 24 years of age in 1968 about 76 percent had completed high school: "Educational Attainment: March 1968", Series P–20, No. 182, of *Current Population Reports*, April 28, 1969, U.S. Bureau of the Census.

[115] *Recent Trends in Social and Economic Conditions of Negroes in the United States*, Bureau of the Census Current Population Reports. Series P–23, no. 26, and Bureau of Labor Statistics Report No. 347, U.S. Government Printing Office, Washington, D.C., 1968, p. 18. Also "Educational Attainment, March 1968" (Census Bureau).

[116] Jaffe and Adams, "Summary Report".

[117] "Estimates of the Population of the United States by Age, Race, and Sex: July 1, 1968" Series P–25, No. 416, of *Current Population Reports*, February 17, 1969, U.S. Bureau of the Census.

[118] See footnote 60.

The 84,000 Negroes who began college (first-time and full-time) in fall 1968 were, as noted in the previous section, 5.7 percent of all full-time freshmen that fall. If the 84,000 were doubled to 168,000 then Negroes would comprise about 11.4 percent of all freshmen, slightly more than the proportion of Negroes in the total population, and only 1.2 percent less than the proportion of all Negroes who were age 18 (12.6 percent) in 1968.[119] Interestingly enough, doubling the 84,000 Negro freshmen to 168,000 would mean that 63 percent of Negro high school graduates would begin college—about the same as the proportion of white male students presently beginning college and close to our hypothetical ceiling. This would not be the case, because the number of Negro high school graduates probably would be increasing also. Since there were 443,000 Negroes aged 18 in 1968, if 80 percent of them—the same proportion as whites—had completed high school then there would have been about 354,000 Negro high school graduates in 1968 rather than 266,000—an increase of 88,000. Taking the 354,000 figure (80 percent high school completion) and our hypothetical ceiling of 70 percent of high school graduates beginning college, then about 248,000 Negroes would have to enter college, or about 164,000 more than entered full-time in fall 1968.[120]

Although we are apparently close to a hypothetical maximum in college entrance for white male students, there is still the question of how many students we can expect to get through college as well as to begin. California leads the nation in getting its high school graduates into college—between 60 and 70 percent enter some sort of college after high school.[121] But California is forty-ninth among the states in the proportion of its public college enrollment that eventually receive bachelor's degrees.[122] Early in this paper I pointed out, using a scheme developed by George C. Keller, that perhaps twice as many high school graduates were entering college than who could be described as "academically talented". Keller's definition of academically talented begins with an IQ on 116, one standard deviation above the mean, and is modest therefore in its definition of academic talent. Most of those who are talented in other ways: creatively, psychosocially (political or social leadership), and even kinesthetically (athletic ability, craftsmanship), will also be found at this level or higher.[123] Mackinnon, in his studies of creativity at the Institute for Personality Assessment and Research at Berkeley, has found that while creativity does not necessarily increase as IQ increases there is a minimum of about 120 IQ needed for intellectually demanding careers so that an individual will be able to master a discipline.[124] If Keller is right, then, too many students are already entering college, which explains much of the failure to complete college (see section 6) and explains why California can lead the nation in the rate of college entrance of its high school graduates but be next to last in the proportion of those college entrants receiving bachelors' degrees.[125]

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[119] Entering freshmen were used to eliminate the need to estimate dropouts if total enrollments had been used, but Negro dropouts, as noted earlier, do not seem to be much more than white dropouts.

[120] If the part-time Negro students were included in these calculations less than, and perhaps much less than, a doubling of the present number of Negro students would be necessary to achieve an approximate "parity". I have not included them because I am not certain how many part-time Negro students there are—as noted earlier. The actual number of Negro students needed to make significant proportional gains in enrollment are not large. To increase from 40 percent of Negro high school graduates beginning college (probably about where we are now) to 50 percent would require only 27,000 more Negro high school graduates to start college. From 50 to 60 percent would require another 27,000, and from 40 to 60 percent, therefore, 54,000. About 62,000 more Negro freshmen (assuming a present 40 percent rate) would achieve "parity."

[121] Stephen A. Hoenack, *Private Demand for Higher Education in California*, unpublished doctoral dissertation, University of California, Berkeley, 1967, table 1, p. 67.

[122] Unpublished data developed by the planning and evaluation staff of the Bureau of Higher Education of the U.S. Office of Education.

As long as higher education requires above average verbal and numerical ability, only about 20 to 25 percent of the total population, and perhaps one-third of high school graduates (a more select group) can expect to succeed in college, although many more than that will try college.[126] As pointed out early in this paper, proportional increases in college entrance will have to come more and more from the third to fifth quintiles of ability, since there is much less room for increases among the more able students. Since students in the third to fifth quintiles of ability score in the 200's and 300's on the scholastic aptitude test or its equivalents, such students will usually fall well below one standard deviation above the mean in IQ, which means that while they may enter college they do not have much chance of success there.

It is becoming increasingly clear that we need other educational alternatives for the upwardly aspiring who are not accomplished in verbal and numerical skills. To admit more and more students into college who are less and less able to succeed there will only result in more dropouts from lack of interest and academic failure—the paradox of California will be repeated on a national scale. It will not do just to declare that vocational training in junior colleges or vocational schools is the answer—for many it certainly is—but much vocational and technical training can be just as demanding or more so than the transfer program of a community college. The problems for the future will be less in getting more students into college than they will be in getting able students through college, and devising educational alternatives for the less able that will satisfy both occupational needs and self-image.

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[123] Keller, "The Search for Brainpower." The average IQ score for high school graduates is 110: Dael Wolfle, "Educational Opportunity, Measured Intelligence, and Social Background," *Education, Economy, and Society*, edited by A. H. Halsey, Jean Floud, C. Arnold Anderson, New York, 1961, pp. 216–240. Proportional increases in high school graduates have lowered the average IQ for high school graduates to an estimated 103 to 105.

[124] See Donald W. MacKinnon, "Education for Creativity: A Modern Myth?" in the book of the same title edited by Paul Heist, Center for Research and Development in Higher Education, University of California, Berkeley, 1967.

[125] The paradox of California cannot be explained by very large numbers of undergraduates entering college who are not "degree-candidates," since three-fourths of all entering freshmen in California are degree-credit students.

[126] Only about one-fifth of the total population is one standard deviation (116 IQ) or more above the mean IQ of 100. About 27 percent of the population falls above 110 IQ; some people can graduate from college with 110 IQ by much hard work and careful selection of courses and programs, therefore I have defined the "college able" population at about one-fifth to one-fourth of the whole population, and about one-third to 40 or 50 percent of high school graduates. In the IQ range from about 70 to 130 the distribution of IQ's approximates a normal distribution. There are small but significant variations from normality above and below this range. For a succinct discussion of the distribution of intelligence in the population see Jensen, "How Much Can We Boost IQ and Scholastic Achievement?", pp. 20–28.

Even if we attain some kind of universal post-secondary education, will the distances between social classes be sharply reduced? Jencks and Riesman, for example, believe that "universal higher education will diminish the economic or social differences among classes a little but not much."[127] As Arthur Jensen has pointed out: "Even if all occupations paid alike and received equal respect and acclaim, some occupations would still be viewed as more desirable than others, which would make for competition, selection, and, again, a kind of prestige hierarchy." Since "there is an intimate relationship between a society's occupational structure and its educational system," Jensen declares, "the assortment of persons into occupational roles simply is not 'fair' in any absolute sense." "The best we can ever hope for is that true merit, given equality of opportunity, act as the basis for the natural assorting process."[128] Jensen cites work of Otis Dudley Duncan and his associates to show that while intelligence influences occupational attainment chiefly through educational attainment, intelligence also is a cause of differential earnings so that men with equivalent education and jobs "are differentially rewarded in terms of mental ability".[129] Presumably, those with more mental ability do better work and are paid accordingly. This last point is important. Although it is well-known that college graduates have higher earnings than high school graduates, ignoring ability of the individual overstates the effect of education on income. Weisbrod and Karpoff analyzed the earnings and education of a large sample of men and concluded that of the differential incomes between high school and college graduates three-fourths of the differences are due to the variance in educational attainment and one-fourth to the greater ability and motivation of the college graduates.[130] A question that cannot yet be answered is what will happen to this ratio if larger and larger proportions of high school graduates also complete college. A likely hypothesis is that the proportion of incomes due to ability would increase *between* college graduates of the same quality education.

The conclusion here, then, is that society values mental ability and high motivation and is willing to pay more for it even though educational attainment be equal. If opportunity for education—in both quality and quantity of education—becomes equal then there will still be significant differential earnings based on the variance in human abilities and motivations.

Educational and occupational attainment is not yet based on merit alone, and whether merit alone will ever act as the only basis for the "natural assorting process" is not certain, but we are moving in that direction. Otis Dudley Duncan in his latest work analyzed family background, educational and occupational achievement of a group of white men who were 25 to 34 years old in 1964.[131] Duncan concluded that intelligence alone accounted for more of the variance in education than did the three family background variables combined (father's education and occupation and size of family). Progress in school is influenced at least as much by intelligence as by family background, but the latter does make a substantial difference in educational attainment. Duncan found that ability influences occupational achievement indirectly principally through educational attainment, but Duncan also found that, like Weisbrod and Karpoff, ability as such also influences occupational achievement directly—as distinct from educational attainment. A large part of the variance in achievement was not related to the social class of birth. Intelligence contributed to the variance between these men in educational attainment, occupation, and earnings independently of family background, therefore Duncan declares that the "meritocratic principle has a guarantee built into it that status will not be perfectly transmitted between generations." He concludes that in our achievement oriented society intelligence "is the primary leaven preventing the classes from hardening into castes." Duncan believes that his conclusion will stand all the stronger "in the event that some appreciable fraction of the variation in IQ itself is ultimately traced to genetic rather than environmental factors . . ." But there already is clear evidence that a large part of IQ is indeed traceable to genetic factors and, therefore, the conventional or "ideal" model of vertical social mobility must be fundamentally revised.

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[127] *The Academic Revolution*, p. 153.

[128] Jensen, "How Much Can We Boost IQ," pp. 13–15.

[129] Jensen, "How Much Can We Boost IQ," pp. 15–16.

[130] See Burton A. Weisbrod and Peter Karpoff, "Monetary Returns to College Education, Student Ability, and College Quality," in *The Review of Economics and Statistics*, November 1968, pp. 491–497. Among the college graduates, the more able and better motivated (measured by the proxy of rank in graduating class and adjusting for varying college quality) were paid more to begin with and this difference widened over time.

[131] Otis Dudley Duncan, "Ability and Achievement," *Eugenics Quarterly*, March 1968, pp. 1–11.

The ideal model of social mobility has been described by Eckland as a system of full equality in which "ability is randomly distributed at birth and that any differences observed among the children of different social strata are solely a matter of environmental conditioning." "Any genetic basis for these differences is dismissed as irrelevant." [132] But it is becoming evident that social classes have a significant genetic basis and that this basis will have to be taken into account in any assessment of social inequalities in our society. The heritability of intelligence forms a constraint upon any attempt to eliminate between-class differences.

A number of recent studies as well as summations of old and new evidence have shown that about "80 percent of the variance in IQ is attributable to hereditary factors and 20 percent to environmental factors." [133] The chief conclusion from a great deal of evidence, for our purposes, is that ". . . SES differences have a genetic as well as an environmental basis." [134] Given the growing evidence that intelligence is largely hereditary and the strong tendency in modern society for assortative mating[135] ". . . it is unrealistic to expect social or educational reforms to wipe out ability differences between groups, when the groups differ in part because of genetic factors".[136] But, as Jensen points out, as the society is improved, and environmental deprivation is reduced, and as equality of educational opportunity increases ". . . the heritability of intelligence and achievement will *increase*, because of the decrease in environmental sources of variation."[137] The less restraint the society places on vertical social mobility the more the sorting of individuals into occupations and social classes will be determined by individual innate ability, which is largely hereditary. But as long as society values intelligence and the mental ability and performance that goes along with it, and as long as society places high value on occupations that draw heavily on mental ability, then we can expect that classes in the society will be sorted by ability and that this tendency is likely to increase rather than disappear as we achieve equality of opportunity.

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[132] Bruce K. Eckland, "Genetics and Sociology: A Reconsideration," in the *American Sociological Review*, April 1967, pp. 173–194.

[133] Arthur R. Jensen, "Social Class, Race, and Genetics: Implications for Education," *American Educational Research Journal*, January 1968, pp. 1–42. For further evidence see: Eckland, "Genetics and Sociology"; Robert C. Nichols, *The Inheritance of General and Specific Ability*, National Merit Scholarship Corporation Research Reports, 1965, Vol. 1; No. 1: J. C. DeFries, "The Genetics of Intelligence: An Overview," unpublished paper, 1969. See also Arthur R. Jensen, "How Much Can We Boost IQ and Scholastic Achievement?", which is probably the most comprehensive discussion of the whole question of social class and IQ; and I. I. Gottesman, "Biogenetics of Race and Class" in *Social Class, Race, and Psychological Development*, edited by Martin Deutsch, Irwin Katz, and Arthur R. Jensen, New York, 1968.

[134] Jensen, "Social Class, Race, and Genetics," p. 15.

While there is increasing evidence that the between-class differences in ability and achievement in the society have a genetic component, it is not clear whether the between-race difference in intelligence is due to genetic differences or is entirely due to environmental differences. It is well known that Negroes consistently score about one standard deviation lower than whites on intelligence and aptitude tests, but there is no agreed upon explanation for it.[138] Jensen in "IQ and Scholastic Achievement" argues that "the preponderance of the evidence is, in my opinion, less consistent with a strictly environmental hypothesis than with a genetic hypothesis, which, of course, does not exclude the influence of environment or its interaction with genetic factors." Jensen states that while such an argument has been denounced, ". . . It has been neither contradicted nor discredited by evidence." Jensen's inclination toward a genetic explanation of Negroes' lower mean scores on IQ and scholastic aptitude tests rests principally on two observations. Firstly, the Coleman Report showed that American Indians are widely regarded as the most environmentally disadvantaged minority group on practically any measure, yet the American Indian ability and achievement test scores were consistently about half a standard deviation above the Negroes' scores. Secondly, it has been shown that the incidence of technical mental retardation (IQ below 75) is much higher among Negro than white children at all SES levels, and in the two highest SES quintiles the ration of Negro to white children with IQ scores below 75 was 13.6 to 1. Jensen feels that if environmental causes were the reason for such differences in mental retardation then there should be less Negro-white discrepancy in the higher SES groups. Whether Negro and white social classes can be equated, however, given the existing social pressures, is debatable.

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[135] Assortative mating is the pronounced tendency for like to marry like, in measured intelligence, educational attainment, and various other socioeconomic characteristics. Assortative mating between genetically similar adults favors "the reproduction of genetically similar children in any given (social) stratum." (Eckland, "Genetics and Sociology.") Eckland believes that assortative mating for intelligence is probably increasing and as the social "system strives to achieve full equality of opportunity, the observed within-class variance among children tends to diminish while the between-class variance tends to increase on the selective traits associated with genetic differences." The effect of assortative mating on IQ scores should not be underestimated. With a standard deviation of 15 and a normal distribution of IQ's, the frequency per million persons above IQ 130 is 22,750, but without assortative mating it would be 9,900 or only 43.5 percent of the present rate. Above 145 IQ the frequency per million is 1,350, but this would fall to 241 or 17.9 percent of the present rate without assortative mating. There are about 20 times more people above 160 IQ with assortative mating than we would have without it. The phenomenon is described in Jensen "IQ and Scholastic Achievement," pp. 35–37.

[136] Jensen, "Social Class, Race, and Genetics," p. 15.

[137] Jensen, *Social Class, Race, and Genetics*, p. 7.

[138] See Jensen, "How Much Can We Raise IQ and Scholastic Per[illegible]". See the Coleman Report also. There is considerable evidence that IQ tests [illegible] the heritability of intelligence: ". . . intelligence tests such as the Stan[illegible] are not so culturally biased as to be incapable of reflecting genetic factors [illegible]n, "Social Class, Race, and Genetics.") Eckland states that ". . . the pres[illegible]etic component in conventional IQ tests has been demonstrated in studies [illegible] adopted children." Eckland points out that IQ and aptitude tests "do not [illegible] ability," but that it does show up in individual and (sometimes) group [illegible] these tests. (Eckland, "Genetics and Sociology.") Jensen in "IQ and Scholastic [illegible]ment" states that IQ tests "can, so to speak, 'read through' the environmental 'ov[illegible].'" De Fries states it well: "However, these measures of intelligence are reliable (both repeatable and internally consistent) and have predictive validity. Thus performance on such tests ('measured intelligence') is a satisfactory character or 'phenotype' for genetic analysis."

While many scholars deny the possibility of a genetic interpretation, other scholars feel that the evidence is not conclusive either way as to a genetic or environmental explanation of Negro differences in IQ scores. Gardner Lindzey, who is an example of the "new breed" of social scientists who are also sophisticated in genetics, asserts that any social scientist with "a reasonable background in genetics" would be unlikely to argue "that there is *no evidence* for genetically determined differences in behavior between races." But Lindzey also asserts that it is virtually impossible to disentangle the genetic and environmental influences on a character so complex as intelligence.[139] Lindzey's statement appears to agree with an earlier article of Jensen's. In January 1968, Jensen wrote that: "As far as I can tell from by search of the relevant literature, research on racial differences does not even begin to permit one to sort out the hereditary and environmental components of the demonstrated phenotypic differences in mental abilities. Therefore, statements concerning the relative importance of genetic and environmental factors in racial differences can at present be nothing but conjecture and surmise." [140] A year later in his "IQ and Scholastic Achievement," Jensen obviously feels that more can be said that evidence does support a genetic interpretation, although Jensen has not tried to quantify the relative importance of heredity or environment between race in his later conclusions. De Fries, however, believes that "we simply do not know" if the difference in mean IQ scores between white and Negro populations is due in part to genetic differences or is entirely environmental. De Fries asserts that "we have no unambiguous evidence concerning what proportion of the variance *between* the racial populations is genetic". [141]

Another explanation offered to account for racial differences in IQ tests is the so-called interaction effect. Harrington explains genetic-environment interaction as " 'one man's meat is another man's poison,' " and even if Negroes were not as capable in scholastic achievement as whites then this could still be an effect of genetic interaction with an unsuitable environment. If the appropriate environment were found Negroes might perform equally well.[142] Eckland similarly feels that if we could identify the right combination of environmental factors that cause the depression of Negroes' scores, and simultaneously held them constant, then the observed differences between Negro and white IQ scores might disappear. This hypothesis is consonant with an environmental interpretation and not a genetic one, and possibly not even an interaction interpretation.[143]

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[139] Gardner Lindzey, "Genetics and the Social Sciences," in *Items*, bulletin of the Social Science Research Council, September 1964.

[140] "Social Class, Race, and Genetics."

[141] "The Genetics of Intelligence."

[142] See Gordon M. Harrington, "Genetics and Education" in the *American Educational Research Journal*, November 1968, pp. 712–717. (Harrington is replying to Jensen's "Social Class, Race, and Genetics.")

Dobzhansky seems to argue for a possible interaction effect when he states that "it is not known" just how plastic psychic or personality "traits might be in different environments that can be contrived by modern technology, medicine, and educational methods." ". . . genes determine, not traits or characters, but the ways in which the organism responds to the environments." [144]

Another cultural phenomenon that could contribute to the racial differences in IQ scores is the differential birth rate for Negroes, as a function of SES. Since SES level is related to genetic factors, and since Negro lower class families have more children than their white counterparts, and Negro middle and upper class families have fewer children than equivalent white families, "one would", Jensen asserts, "predict a genetically determined divergence of the (IQ) means of the two racial groups." [145]

To the extent that racial differences on IQ test scores are environmentally determined they can be remedied. If the differences are due to genetic-environment "interaction effect" this too can probably be remedied if we can find the right kind of environment that will unlock the latent genetic potential. But if the differences are genetically determined then there may not be much that can be done by educators and psychologists. If the difference can be attributed to birth differentials then birth differentials can be changed by more effective family planning, and may eventually take care of itself as Negroes become more affluent and better educated. But the implications of these factors have to be taken into consideration—just as with the between class differences—in our attempts to provide true educational equality of opportunity ah well as understanding the constraints on what we can do.

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[143] Bruce K. Eckland in a review of Shuey, *The Testing of Negro Intelligence, in Eugenics Quarterly,* March 1968. Martin Deutsch and his associates have developed a "deprivation index" to try and do what Eckland recommends. See *The Disadvantaged Child* by Martin Deutsch and Associates, New York, 1967, chapters 15 and 16.

[144] Theodosius Dobzhansky, "Genetics of Race Equality," in *Eugenics Quarterly,* December 1963, pp. 151–160.

[145] This phenomenon is described and its implications discussed in both of Jensen's articles. Also see Clyde V. Kiser, "Trends in Fertility Differentials by Color and Socioeconomic Status in the United States," *Eugenics Quarterly,* December 1968, pp. 221–226.

PART III

THE QUALITY OF OUTPUT AND THE COSTS OF HIGHER EDUCATION INSTITUTIONS

7

An Exploration of the Determinants of Effectiveness in Higher Education

Robert H. Berls*

INTRODUCTION

The purpose of this paper is to review, analyze, and summarize what have been found to be determinants of quality in undergraduate education in American colleges and universities. I will explore the methods used to discover the impact of college on students, and the results obtained. I should make it immediately clear that I have counted nothing, sent no one a questionnaire, and I am not even reporting on a conference. My aim is only to inquire of what can be reported about the nature of quality in the education of undergraduates.

The usual means of measuring quality in a college or university is to display such indicators as the number of books in the library, the income or expenditures per student, the percent of Ph.D's on the faculty, or the ever-rising mean SAT scores of the freshmen classes. But these are inputs rather than products and the chief reason they serve as goals is because they are easily measured. The college that ranks high on these measures prides itself on them, while in many cases it has little or no idea about what really happens to its students.[1] As Lewis Mayhew has written:

> Regardless of how many Nobel Prize winners a campus boasts, of how many lectures or concerts come to the campus, of how rich are the library holdings, of how many courses are in the college catalogue, they are not educationally effective unless students interact with them.[2]

This interaction and educational effectiveness will be the chief concern of this paper. The usual indices of quality will be largely ignored.

I. THE SEARCH FOR PRODUCTIVITY

One frequent approach employed in the qualitative ranking of institutions has been to count the number of a college's baccalaureates who go on to win Ph.D's. The rationale behind this is simple: students who earn doctorates must be intellectually active and capable, therefore the number of baccalaureates of a college who later earn the doctorate, per X number of graduates, must be an easily verifiable index of the educational quality of a college. The goal is agreed upon and easy to quantify.

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[1] These variables also tend to be highly interdependent: find the amount of income or expenditure per student and all the others then fall into line, but one still knows no more than before.

[2] Lewis B. Mayhew, "Institutional Factors and the Learning Environment," in *The Student in Higher Education,* American Council on Education, Washington, D.C., 1965, p. 42.

The first of the large scale productivity studies to appear was *Origins of American Scientists* by R. H. Knapp and H. B. Goodrich (Chicago, 1952). Knapp and Goodrich, concerned with an impending shortage of scientists, quite reasonably decided that they ought to ascertain which institutions were producing scientists. The results were surprising to many. Eighteen thousand scientists, who held the Ph.D. or had produced an equivalent body of research, were considered for the period they had attended college (1924–1934) at 490 colleges and universities. A productivity index was established by dividing the number of male scientists by the total number of male graduates. The characteristics of the 50 institutions highest on the productivity index of scientists were predominantly small liberal arts colleges. Only 6 of the 50 were technological institutions, and a preponderance of the institutions were from the middle and far West. For the period 1924–34 the mean production of baccalaureates who went on to become research scientists was 3.9 with a standard deviation of 1.4. Reed College was first (131.8) and rose to 5½ standard deviations above the mean. Second was Cal. Tech. at 70.1, Harvard and M.I.T. were 18.4 and 18.9 respectively. Colleges of high or low costs were less productive than colleges of middling costs.

Origins of American Scientists was followed in 1953 by Knapp and Joseph Greenbaum, *The Younger American Scholar: His Collegiate Origins* (Middletown, Conn.), which identified the undergraduate origins of scholars in all disciplines who achieved the bachelor's degree in the years 1946–51, and also had either earned the Ph.D. or been awarded university, government, or private foundation fellowships exceeding $400 per year for doctoral study. Knapp and Greenbaum found scholarly productivity to be concentrated among a very small group of institutions. Fifty or so colleges out of the more than 800 granting bachelors' degrees attained a rate of male Ph.D. production in excess of 10 per thousand, and among this group the range is from 10 to about 60. All the remaining institutions are crowded within a narrow range lying from 0 to 10 per thousand, with very heavy concentration at the lower value. The results showed that high cost colleges were now unusually productive, that the geographical gradient observed by Knapp and Goodrich was less sharply defined, and that universities and liberal arts colleges cannot be so sharply differentiated. The authors found the cost discrepancy with the earlier study most challenging. For every sample (by discipline and sex) the highest fifth for cost of attendance is at least twice as productive proportionately as the remaining institutions.

The factor of cost attendance proved consistently the most significant variable in differentiating productive from unproductive colleges. The discrepancy between the two studies was explained by the authors' proposition that eastern high cost colleges had in the past two decades (1933–1953) undergone something of a revolution in character, both with respect to intellectual climate and student clientele.

They attribute this to three factors: The GI bill which enabled students of superior abilities and motivations to attend these institutions; secondly, eastern colleges of high cost were generally supporting scholarship programs at a level unknown and unanticipated during the period of the earlier study; third, the high general prosperity of the nation after the war enabled attendance at these high cost colleges of students who were previously excluded for financial reasons.

The altered condition of science was also a factor in the authors' explanation of discrepancies between the two studies. The dramatic achievements of science in World War II and its increased prestige and financial return made it acceptable for classes which seldom before had made it a vocation. Twenty years earlier, the training and orientation of science was pragmatic in spirit and applied in content, but science had taken since then a marked turn for the theoretical and intellectual. Thus, between the years included in the two studies, the more renowned institutions had greatly improved their relative standing in the production of scientists, at the expense of the grass-roots institutions.

The humanities were conspicuous for the small number of institutions which make effective contributions to this area. Among universities, the highest fifth in cost is about five times more productive of fellowship awardees in humanities as the rest. Colleges of high productivity in the humanities are concentrated in New England especially and the northeast in general—thus recruitment of scholars for this field rests upon a singularly narrow base.

Robert Knapp, in his latest exploration of the baccalaureate sources of scholarship: *The Origins of American Humanistic Scholars* (Englewood Cliffs, New Jersey, 1964), found that for the period 1936–1959, ten institutions accounted for the baccalaureate origins of between a quarter and a fifth of all humanistic scholars (history, philosophy, English, foreign languages, fine arts and music). Half of all humanistic scholars derive their baccalaureates from about 42 institutions, or less than 4 percent of all institutions granting bachelors' degrees in 1959. Knapp found no broadening of the base in the period from 1936 to 1945 and from 1946 to 1959, and Knapp says there is no indication that the baccalaureate origins of humanistic scholars have become more extended since.

The concentration of female scholars in the humanities (baccalaureate origins) is even more extreme: 10 institutions accounted for almost one-third, and 34 colleges for over half, of all female scholars in the humanities.

Astin and Holland[3] in 1962 reported a close interrelationship of financial resources of colleges, student quality, and Ph.D. outputs (baccalaureate origins). A sample of 340 4-year colleges in 1959 found that the baccalaureate origins—Ph.D. outputs of high endowment private institutions in the sample averaged 10.3 percent, whereas the low endowment colleges were only 3.0 percent. High budget public institutions had a productivity score of 4.0 percent and the low budget public institutions 3.2 percent.

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[3] Alexander W. Astin and John L. Holland, "The Distribution of 'Wealth' in Higher Education," *College and University*, Winter 1962, pp. 113–125.

In separate productivity studies Astin[4] and Holland[5] controlled for student input by using a sample of National Merit Scholarship Corporation (NMSC) winners and near-winners, and analyzed college attendance and choice for this high aptitude high school senior sample. They concluded that differential institutional productivity is a function of the concentration in those productive colleges of exceptionally able students with high academic motivation. Knapp, Goodrich, and Greenbaum, while not disregarding student quality attending their most productive institutions, tended to put the greater emphasis on the institutions: faculty, objectives, and intellectual atmosphere.

Heist *et al*[6] hypothesized that the highly productive colleges in the Knapp and Greenbaum index are more attractive than the less productive institutions to National Merit Scholars with high scores on certain personality tests designed to measure attributes closely related to intellectual orientation and intellectual functioning. To demonstrate their hypothesis that the highly productive colleges get not only high ability students but students of a more intellectual orientation, the authors prepared a sample of the NMSC winners and near-winners (Certificate of Merit) in 1956. The total sample was in about 31 colleges. To eliminate ability differences, students at low productivity colleges were drawn at random and matched in Scholastic Aptitude Test scores with students in the high productivity colleges. The authors concluded "that students of high ability attending highly productive institutions have a pattern of traits, values, and attitudes which is more closely related to serious intellectual pursuits than have students of high ability attending less productive institutions."

A concluding hypothesis put forward by the authors was that the high productivity of some schools is the outcome not only of the quality of student input, or the college itself, but of a fortunate combination of faculty and student expectations, interest, and values.

Astin found that he could predict "relatively accurately" the actual Ph. D. output of a college from an expected Ph. D. output based on sex, major fields, and intelligence level of its students.[7] He applied his scheme to a sample of 265 institutions. Public institutions were found to be significantly over-productive (excess of actual over expected) whereas eastern mens' colleges were found to be significantly under-productive (lower actual than expected).

Astin attributed the under-production of the eastern mens' colleges to their graduates entering earlier into business and professional careers thereby being diverted from the pursuit of graduate academic degrees. In addition, the attainment of a doctorate may not represent the same degree of personal achievement or social mobility to the typical student of the eastern men's college than it does to the student of comparable ability enrolled in other colleges. Astin concludes that Ph. D. productivity may not be a sensitive measure of the effectiveness of undergraduate institutions.

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[4] Alexander W. Astin, "Undergraduate Institutions and the Production of Scientists," *Science*, 26 July 1963, pp. 334–338.

[5] John L. Holland, "Undergraduate Origins of American Scientists," *Science*, 6 September 1957, pp. 433–437.

[6] Paul Heist, T. R. McConnell, Frank Matsler and Phoebe Williams, "Personality and Scholarship," *Science*, 10 February 1961, pp. 362–367.

[7] Alexander W. Astin, " 'Productivity' of Undergraduate Institutions," *Science*, 13 April 1962, pp. 129–135.

The impact of the early productivity studies of Knapp, Goodrich, and Greenbaum and the pulling and tearing at the structure they raised by scholars since then is a little hard to fathom today. Those studies did serve to focus attention on student output of undergraduate colleges and they were useful at the time. As C. Wright Mills once remarked: "When little is known, or only trivial items publicized, then plain description becomes a radical fact . . ." Perhaps then, we may understand the impact, at the time, of those early studies. But as David Riesman observed: There are problems "in assuming that scholarly and scientific vocations are an adequate test of the quality of a college." Riesman concluded, however, that "These detailed and careful investigations are an essential first step towards a comparative analysis of colleges." [8]

The slant of the evidence generated by the productivity studies is directed to the conclusion that the scholarly product of a college rests largely on the academic abilities, attitudes, and values of the students who enter it. The unanswered, and more difficult, harder to measure, question is what happens to the students in the college? The inquiries into the nature of higher education since the productivity studies began to run into dry sands have taken two broad directions: The search for change in the students, and the search for the impact of the college environment on the student. The two approaches share the same goal of the effect of the college experience on students, but the means of inquiry are different.

II. HOW MUCH CAN MAN CHANGE?

Heist demonstrated that students of very high college aptitude had already made a significant self-selection in their choice of college.[9] The students with the more pronounced intellectual orientation went to the colleges that were more productive of future scholars and scientists than did students who were otherwise equal, and who, given their National Merit Scholarships or Certificates of Merit, probably could have gone to their first choice college. Holland,[10] in his analysis of productivity, determined that the parents of NMS winners and near-winners who went to high productivity colleges placed a high value on "learning how to enjoy life, and developing mind and intellectual abilities," while those whose children (NMS winners and near-winners) went to colleges which ranked lower in productivity placed less emphasis on intellectual goals.

Thus the conclusions before us is that the parents of high aptitude college students not only have a formative influence on the students' attitudes and natures, but also on where he goes to college, thereby affecting the Ph. D. productivity rates of those colleges. But productivity rates are a fruitless way of trying to measure the impact of college on students. As Sanford observed:

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[8] "The Jacob Report", a review article in the *American Sociological Review*, volume 23, 1958, pp. 732–738.

[9] Heist *et al.*, "Personality and Scholarship."

[10] Holland, "Undergraduate Origins."

It seems that most attention has been given to the question of what factors in the college situation contribute most to the production of scientists and scholars, and to the question of what is the economic value of a college education or of education at particular colleges. Although the prestige of institutions has depended heavily upon how they fared in studies of these kinds, it is clear that such research has little bearing upon the aims of liberal education.[11]

The search for fundamental changes in personality, intellectual outlook, values and attitudes in college students, rather than just adding to intellectual skills or cognitive content, turns on the question of how much can man change and at what periods in life.[12]

Although American social science has only recently adopted the psychoanalytic view of man, the conviction has become rapidly widespread that human personality is shaped in infancy, and that the early characteristics are extremely resistant to change.[13] After early childhood the incremental increases in mental ability become smaller, as a result there is general belief that by early adolescence further increases in mental ability are negligible, Piaget, for example, believes that the child-adolescent reaches an equilibrium at about 14–15 years.[14] There is increasing disposition by psychologists to question this view. Webster, Freedman, and Heist feel that the belief that increases in mental ability are negligible after age 16 or 17 "is an absurd oversimplification that persists despite growing evidence to the contrary." [15] Part of this oversimplification is due to the vast researches that have gone into early childhood to the neglect of later years. Although there has been a half-century of research on the socialization of the child "there has been much less work, virtually none in comparison, on socialization at later stages of the life cycle." [16]

Only now are theories being developed to account for the effect of higher education on human development. There is a growing feeling that while the effect of early childhood is critical there is still definite potential for growth and change in personality development at any period in life, but particularly in adolescence and early adulthood.[17] Recent research has begun to demonstrate that although some individuals do not gain after age 18, many will continue to gain after age 21. Gifted adults make substantial gains in reasoning ability even after age 30 and, in general, gifted persons are unlikely to become maximally productive until well after age 40. The higher the potential mental ability, the less likely it has been approximately by the time of college entrance. More often than not, "the freshman student of superior ability will be *less* mature, in terms of his own developing ability, than will his less gifted friends." Superior students mature later than other students, and educators will have to take this into account.[18]

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[11] Nevitt Sanford, "Higher Education as a Field of Study," p. 71, in Nevitt Sanford, editor. *The American College: A Psychological and Social Interpretation of the Higher Learning*, New York, 1962.

[12] Freedman conceives of personality change among students as the total impact of the college on the student, cognitively, personality development, attiudes and values. By personality he means the whole person—the individual in his entirety. Mervin B. Freedman, *The Student and Campus Climates of Learning*, an unpublished paper prepared for the Office of Education of the U.S. Dept. of Health, Education, and Welfare, Washington, D.C., 1967. This paper will be number 18 in the series: "New Dimensions in Higher Education."

[13] See Benjamin S. Bloom, *Stability and Change in Human Characteristics*, New York, 1964, and a review-article of Bloom's book by Bruno Bettelheim: "How Much Can Man Change?" published in *The New York Review of Books*, Sept. 10, 1964, and reprinted in *Profile of the School Dropout*, edited by Daniel Schreiber, New York, 1967, pp. 215–224.

[14] Jean Piaget and Bärbel Inhelder, *The Growth of Logical Thinking*, New York, 1958, p. 335.

[15] Harold Webster, Mervin Freedman and Paul Heist: "Personality Changes in College Students" in *The American College* edited by Nevitt Sanford, New York, 1962, p. 819.

[16] Orville G. Brim, Jr. "Socialization Through The Life Cycle," in *Items*, Bulletin of the Social Science Research Council, March 1964, pp. 1–5.

[17] See James W. Trent and Leland L. Medsker: *Beyond High School, A Study of 10,000 High School Graduates*, Center for Research and Development in Higher Education, Berkeley, California, 1967, Ch. 1.

The increasing, if yet still grudging, acceptance by psychologists that basic change is possible in late adolescence holds strong implications for higher education. Research on the phenomenon of value therefore, has turned to the effect of college on students' values and attitudes. Even Bloom, one of the skeptics about change in late adolescence and early adulthood, feels that it is possible that change can take place in college, especially in the first two years, and that more change appears to occur in these two years than in the next ten to twenty years.[19]

While reservations are often expressed as to what college *is* doing to students, there is a consensus that college can and should foster human development.[20]

Bloom suggests that since the studies he used in preparing his evaluation of the possibilities for human change are based on surveys and norms, vigorous experimentation may lead to different conclusions about what can be done at ages later than early childhood.[21] I would suggest that the huge "system" of American higher education is not really a system, and that there is sufficient variety in kinds and quality of institutions, educational purposes, varying means of organizing instruction, and greatly varying abilities and preparation of students, so that our higher education does constitute a sort of natural experiment in the higher schooling. It now remains to be seen whether that experiment has so far led to any conclusions about what can be done with human beings in the college years.

III. THE SEARCH FOR CHANGE

In 1957 Philip Jacob, a political scientist at the University of Pennsylvania, published a small book called *Changing Values in College, an Exploratory Study of the Impact of College Teaching.*[22] Jacob's book summarized all relevant research on the impact of college (particularly of general education courses in the social sciences) on students' values.

Jacob defined values as "preferences, criteria, or choices of personal or group conduct." The questions asked were: What is the impact of the curriculum, the instructor, and teaching methods on students' values? Does a more significant development of values occur at some institutions than at others? If so, what characterizes these potent institutions? [23]

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[18] Webster, Freedman, and Heist, "Personality Changes," pp. 819–820.

[19] Bloom, *Stability and Change,* p. 178.

[20] See Trent and Medsker, *Beyond High School,* Ch. 1, and Nevitt Sanford, *Where Colleges Fail,* San Francisco, 1968, and Sanford, *The American College.*

[21] Bloom, *Stability and Change,* pp. 217–218.

[22] New York, 1957. Jacob's research and writing was subvented by the Hazen Foundation of New Haven, Connecticut.

Jacob's book summarizes most research on student values and attitudes done since the 1920's. He reviewed well over 300 studies, reports, and articles, some of them one-time, some before and after, some cross-sectional, and others longitudinal. Some studied several thousand students at multiple campuses and others only a small group in an experimental course. Jacob believed that these various surveys were comparable, and since the data were remarkably consistent and the responses similar despite the differing contexts in which the responses were made, that they could be put together to form a composite view of student values.[24]

The overall conclusion of Jacob's book is that college does not make a fundamental difference for most students. "Basic values remain largely constant through college. College socializes but does not really liberalize the student." [25] His conclusions about the influence of different aspects of the college environment can be briefly listed:

- the influence of the curriculum is dependent on the "value-climate" of the surrounding college community. Jacob could not find significant change in student values attributable to the curriculum;
- the method of instruction has only a minor influence on students' value judgments;
- for most students the quality of teaching has little effect upon the value outcomes of general education—in the social sciences or other fields;
- denominational colleges had little positive effect on their students' religious attitudes;
- students are more likely to be similar to their college in their values regardless of field of study or degree pursued unless other factors are present.

Student ratings of faculty are generally favorable but in the nature of being "good fellows." The faculty "do not carry weight." "They do not cut deep," nor do they "disturb, shock—quietly touch—the wellsprings of motivation." Jacob feels that faculty had more influence at those colleges where association between students and their instructors is normal and frequent, and where the faculty is "receptive to unhurried and relaxed conversations out of class." [26]

Because of the widespread attention brought about by Jacob's generally pessimistic conclusions about the impact of college, the Hazen Foundation commissioned Allen Barton, a staff member of the Bureau of Applied Social Research at Columbia University, to examine Jacob's methodology and the methodologies of the studies upon which he based his own analysis. Barton's analysis concludes that the necessary data to prove or disprove Jacob's conclusions are not yet available.[27] Barton comes to a decision that "The most reasonable verdict which now can be drawn on Jacob's overall conclusions of

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[23] Jacob, *Changing Values*, pp. xiii–xv.

[24] Jacob, *Changing Values*, p. 14.

[25] Jacob, *Changing Values*, p. 38.

[26] For Jacob's discussion of the above conclusions see his summary chapter and the individual chapters on curriculum, teaching methods, etc.

[27] See Paul F. Lazarsfeld's foreword to Barton's review.

American higher education is one of 'not proven'." "Jacob has performed an invaluable service in summing up the available evidence; but his conclusions are best taken as a set of challenging hypotheses." [28]

About the same time as Jacob's book was printed, the first reports of a long term study of students were being published. With financial support from the Mellon Foundation, Vassar College established what is probably the most intensive existing study of the students and alumni of one college. The Vassar student study began in 1952 and continued until the early 1960's.

The Vassar research program began with a consideration of the commonly accepted objectives of liberal education and how well these objectives were being attained by the College.[29] A liberal education is usually considered to have the task of familiarizing the student with his cultural heritage, of exercising his intellect, and developing the individual as a whole person. These goals can be further defined as disciplined intelligence, responsible citizenship, curiosity, independence of judgment, sense of reality, interest in other cultures, to live more fully no matter what one's specific life situation—the emphasis is not so much on doing something as on being something. As Sanford states: "The kinds of intellectual, moral, social, and emotional characteristics which the liberal college usually seeks to develop or to foster, and those which it seeks to reduce or to eliminate, are much like those which concern the psychologist when he thinks about maturity or health or the optimum functioning of the individual." [30]

Sanford and his associates believed that the study of personality development after age 17 or 18 might yield information useful to the educator, furthermore, the study might be interesting and challenging in its own right, for the area is one to which psychologists have given little attention. Developmental change of personality was to be emphasized, because, Sanford says, few students of personality or social psychology today would be content to limit themselves to intellectual abilities in relation to academic achievement. The chief questions addressed by the project were: In what ways do people change after 17? Are these changes in the underlying personality structure itself or merely in behavior? If there are changes in personality, in what areas and at what levels do these occur? Above all, what are the determinants and the processes of change? [31]

The study began with the 1952 entering class of Vassar (N=430). By 1956 they had tested five entering classes, in September, within three days of entrance. By 1956 four senior classes were tested (N=280 average) in the spring semester before graduation. The class of 1956 was the first to be tested both as freshmen and seniors. The seniors received the same test battery they did as freshmen. Interviews were conducted—at random—within the sample (the whole class). Eighty freshmen were interviewed so as to make sure they would have at least fifty as seniors. Three interviews were conducted of the freshmen, two of sophomores and thereafter.

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[28] Allen H. Barton, ***Studying the Effects of College Education, a Methodological Examination of Changing Values in College,*** New Haven, Connecticut, 1959, p. 76.

[29] The first extensive reports of the Mellon Foundation research at Vassar were published under the general title of "Personality Development During the College Years" in *The Journal of Social Issues,* whole of issue number 4, 1956, vol. XII. [The research at Vassar was under the general direction of Nevitt Sanford (later Mervin Freedman), and the staff comprised several psychologists, a sociologist, and an anthropologist.

[30] From Nevitt Sanford's introduction to the above, p. 4.

[31] From Sanford's introduction.

The test battery used in the Vassar studies was based on the standard Minnesota Multiphasic Personality Inventory (MMPI) developed at the University of Minnesota, and the California Psychological Inventory (CPI) developed at the University of California. Along with these were used the F Scale to measure authoritarianism and the E Scale to determine ethnocentricity. These latter two scales were also developed at the University of California.[32] Harold Webster, a staff member of the Vassar study, designed the Developmental Status Scale based on the MMPI, CPI, the Maslow test for Dominance Feeling in Women, and new items.[33] This scale effectively discriminates seniors from freshmen, and work at the Center for Research and Development in Higher Education at the University of California has shown that it works as well at other colleges and with men. Sanford, Mervin Freedman, and Webster developed at Vassar the Impulse Expression Scale (IE) which also discriminates seniors from freshmen and at other colleges. The IE scale assesses a general readiness to express impluses and to seek gratification either in conscious thought or in overt action. High scorers value sensations and have active imaginations. They also developed a further measure to evaluate authoritarian tendency—the Social Maturity Scale (SM).[34] The Development Status, IE, SM and several other scales comprise the Vassar Attitude Inventory. The F and E scales and the Vassar Attitude Inventory were then used in place of the MMPI and the CPI.[35]

One should remember that at this time there had been very little research on college students, and the Vassar study staff members had to make up suitable personality scales as they went along. The MMPI is a personality scale designed for clinical diagnosis rather than for measuring developmental change in college students. When Newcomb began his four-year study of Bennington College in 1935, the only instrument he could find suitable was the new Political and Economic Progressivism Scale or PEP.[36]

The scales of the Vassar Attitude Inventory have formed part of the Omnibus Personality Inventory (OPI) developed by Paul Heist, Harold Webster and others at the Center for Research and Development in Higher Education at Berkeley. The OPI is a personality inventory therefore specifically designed for research on growth and change in college students.

The test studies at Vassar centered on the nature of the differences between freshmen and seniors, while the interview studies have attempted to shed light on the factors operative in the college experience which bring about these changes. Vassar seniors score significantly lower than freshmen on the F and E Scales and significantly higher on the Developmental Status, Impulse Expression, and Social Maturity Scales. For example: incoming freshmen classes at Vassar yield means on the F scale (authoritarianism) ranging from 115 to 118 with a standard deviation of about 25. Means for graduating seniors cluster around 95 with a standard deviation about 24. (The mean F score for Vassar entering freshmen is usually the same as reported for mature middle-class women—See Adorno, Sanford, *et al. The Authoritarian Personality*, p. 266.) The scores on the Developmental Status Scale show that Vassar seniors are flexible and uncompulsive when compared with freshmen, less censorious of people, but more critical of the institutional authority of family, state, or religion. High scorers (seniors) are also more intraceptive, nonconforming, free of cynicism, realistic, and mature in interests. Testing of Vassar alumnae three and four years after graduation with the same test batteries they took as freshmen and seniors shows that these trends are neither continued nor reversed during the early post-college years.[37]

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[32] See Theodor W. Adorno, Nevitt Sanford, *et al.*, *The Authoritarian Personality*, New York, 1950.

[33] See H. Webster, "Changes in Attitudes During College," *Journal of Educational Psychology*, vol. 49, 1958, pp. 109–117.

[34] See Webster, Sanford, Freedman: "A New Instrument for Studying Authoritarianism in Personality," *Journal of Psychology*, vol. 40, 1955, pp. 73–84, and Sanford, Webster and Freedman: "Impulse Expression as a Variable of Personality," *Psychological Monographs*, 1957, vol. 72, No 11 (whole No. 440).

[35] The development of these instruments is further described by Mervin B. Freedman, one of the Vassar student study staff members, in his recent book: *The College Experience*, San Francisco, 1968.

[36] Theodore M. Newcomb, *Personality and Social Change, Attitude Formation in a Student Community*, New York, 1943; see ch. 3. (The MMPI was not published until 1943.)

Webster believes that the decreases on the E and F Scales and the elevations on the other scales are evidence that education is really taking place. The Vassar study staff says that "We are inclined to regard many of the changes that have been reported in the papers as changes in underlying personality structure; not merely changes in surface behavior."

The Vassar seniors, the authors feel, have arrived "at a half-way point on the road to being that kind of autonomous person which liberal education strives to produce." What happens to them afterwards depends on whether they enter a life situation that permits growth, or whether they find some quick but repressive means to relieve the stress or upset caused by the educational process and the added instability of the senior year when the security of the college must be left and life decisions made.[38]

As we have seen, the Vassar College study found general improvement between freshmen and seniors in the attitudes and values that are usually associated with liberal education, and these gains persist. But the Vassar study limited itself to the students and alumnae of that college. There were no comparisons of students at other colleges or with high school graduates who do not go to college.

Walter Plant, a psychologist at San Jose State College in California, wanted to see if there are changes in such attitudes as intolerance and authoritarianism with increments of higher education or with no higher education at all. Plant's population was made up of several comparison groups: (1) students who apply to San Jose State College and are admitted but do not enter (some of these do not enter any other college); (2) those who enter the college and do not finish the total number of semesters possible in a given time period—two or four years; (3) those who do finish the possible number of semesters in two or four years.[39]

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[37] For the discussion of the testing program at Vassar see Harold Webster, "Some Quantitative Results" in *The Journal of Social Issues*, and Freedman, *The College Experience*.

[38] See Sanford's conclusions, and Freedman, "The Passage Through College" in *The Journal of Social Issues*.

[39] Walter T. Plant, "Longitudinal Changes in Intolerance and Authoritarianism for Subjects Differing in Amount of College Education Over Four Years" in the *Genetic Psychology Monographs*, November 1965, Vol. 72, pp. 247–287.

Plant's survey instrument was a 100 item test booklet he called an "Opinion Questionnaire" made up from the E and F Scales (California-Adorno, see above) and the D (Dogmatism) Scale developed by Milton Rokeach (see *The Open and Closed Mind* by Rokeach, New York, 1960). (Authoritarianism, ethnocentricity, and dogmatism are interrelated characteristics.) The questionnaire was administered to students and non-student admittees in 1958, 1960, and 1962. Plant reports a general finding for the net change in mean 1958 to mean 1960 E, F, and D Scale scores to be greatest for those with the highest number of semesters during the two years and lowest for those with the fewest number of semesters. The four-year study showed the same results as the two-year study: college attendance (at San Jose State) facilitates reduction of authoritarianism, ethnocentricity, and dogmatism, but this is a change that appears to be underway in young adults who aspire to college irrespective of whether they go on to college. Plant's results also indicate that beneficial change in the study variables was probably greater during the first two years of the study than during the last two years. Two conclusions are drawn from this study by Plant: (1) with intellectually able college aspiring youth, personality characteristics as well as intelligence developed over a longer period of time than is generally thought to be the case, and (2) while there was general beneficial change in the study variables for the sample, those who went to college changed the most. Thus Plant describes college experience as facilitating change.

Plant and Charles W. Telford conducted a second study comparing students who attended junior college for varying lengths of time with those high school graduates who were admitted to one of the six California community colleges participating in the study, but who never enrolled in any college.[40] In 1960 the authors administered a test battery composed of the D and E Scales, five scales from the California Psychological Inventory, and the Allport-Vernon-Lindzey Study of Values, to 4,506 students who had applied, were admitted, but had not yet entered, the six two-year colleges. All the scales were again administered in 1962 to as many of the sample who could be reached by mail. Plant and Telford concluded that students who attended a community college for three or four semesters did not change significantly in attitude any more than those who did not attend at all. These findings conflict with Plant's results in the four-year study where students who attended college four years changed more than those who attended college less or who did not attend at all—even though all comparison groups showed beneficial change in the study variables. (All scales used in these various studies, OPI, CPI, D, E, and F Scales, and the AVL Study of Values, correlate significantly with each other.) However, as Trent and Medsker point out, there was a very great sampling loss for the second administration of the test battery in the two-year college study. Only 38 percent of the entire sample responded after two years, and only 32 percent of those who did not attend college at all [41]. This could cause a biased sample.

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[40] Plant and Telford, "Changes in Personality for Groups Completing Different Amounts of College Over Two Years," in the *Genetic Psychology Monographs*, 1966, Vol. 74, pp. 3–36.

[41] Trent and Medsker, *Beyond High School*, pp. 190–193.

Of course, the study, as in the four-year study, surveyed only students who were motivated to enroll in a college, and then only those attracted to a junior college. Trent and Medsker found in their own study that public junior college students came from lower and more culturally deprived backgrounds than four-year college students, and were less autonomous in measured attitude and more restricted in intellectual disposition. Trent and Medsker also criticize the Plant-Telford study for its statistical techniques: the t test used by Plant and Telford, they claim, "is inadequate to test the significance of group differences on scales that are intercorrelated, and should have been supplemented by a measurement of differences between the group differences." "The t values alone indicate that there was a great deal of difference in amount of change exhibited by the three groups in the study."[42]

In his conclusions to the first reports on the Mellon Foundation studies at Vassar College, Nevitt Sanford hypothesized that such general trends of change as he and his associates had observed were due less to specific factors in the college environment than to the general functioning of the college as a whole. Therefore, a reasonable approach, Sanford feels, would be to give the same tests in the same way in a variety of colleges chosen in some specific way.[43] The next study to be considered attempted to do that kind of large scale testing in a large number of colleges.

In 1959, the Center for Research and Development in Higher Education, at the University of California, Berkeley, began a five-year longitudinal study of 10,000 high school seniors. The sample was drawn from 16 communities of varying sizes and kinds from across the United States. The study follows the personal, educational, and vocational development of the students, and will be published in three books, of which *Beyond High School*, (1967) by James W. Trent and Leland L. Medsker, has already been referred to.[44] Forty percent (3,911) of the 1959 high school seniors entered college in the fall of 1959, and sixty percent (5,867) went to work, into the armed services, became housewives, entered vocational training, or otherwise did not begin college. The college students entered or later transferred to more than 700 institutions of higher education. The study kept track of the employment and college attendance patterns from 1959 to 1963 and also investigated factors associated with college withdrawal. The authors focus on the "experimental" group who entered college and the "control" group who immediately went to work. The groups are compared on values and attitudes as measured by psychometric scales and according to their reported evaluations of work and college experience during the course of the study—these last by questionnaire and interview.

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[42] See *Beyond High School*, pp. 190–193. Also community college students generally live at home, and students who live at home are less susceptible to the "value-climate" of a college.

[43] Conclusions to "Personality Development During the College Years" in *The Journal of Social Issues*.

[44] This is the second of the three. The third will appear in 1969, and the first, by Medsker and Trent (1965), is *The Influence of Different Types of Public Higher Institutions on College Attendance From Varying Socioeconomic and Ability Levels*.

The longitudinal sample of the study was divided four ways:

1. high school graduates who remained in college for four years;
2. high school graduates who remained employed during this time;
3. college withdrawals who atended college a minimum of one year and maximum of three years;
4. women who became full-time housewives immediately after high school graduation—they neither worked nor attended college.

As noted earlier, groups one and two were the "experimental" and "control" groups.

Complete longitudinal data were obtained from nearly 50 percent of the original sample; about 70 percent of those still in college responded. Although a considerable percentage of both college and non-college subjects responded in 1963, the college group was overrepresented among the final respondents in 1963. The final, longitudinal response in 1963 was college 60 percent (2,809) and non-college 40 percent (1,863) for a total of 4,672 of the original sample of 9,778.

Differences in ability and background were minimized in the analysis by holding constant level of ability and socioeconomic status.

The high school seniors were given a test battery composed of a verbal intelligence test, a student questionnaire developed by the study staff, and five attitude scales from the Omnibus Personality Inventory.[45] Class ranks and academic aptitude scores were obtained from the students' high schools. The questionnaire was designed to gather extensive information about the students' background, educational or work plans, etc. During the next four years the subjects were kept track of with postcard questionnaires, telephone, students' records from college registrars, and checklists about the students sent to registrars. During 1962 and 1963 every twentieth subject was intensively interviewed, about 400 interviews all told. Four years after the original testing the subjects were again administered a comprehensive questionnaire and the same personality scales, plus five aditional scales from the OPI.

The development of autonomy most distinguished the "experimental" group of college persisters from the "control" groups of withdrawals and especially the non-attenders. There was a strong relationship between entrance to and length of stay in college and the growth of open-minded, flexible, and autonomous disposition as measured by the Social Maturity and Non-authoritarianism Scales.[46]

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[45] The Omnibus Personality Inventory is made up of 350 items and the format is similar to the Minnesota Multiphasic Personality Inventory. Scale reliabilities are in the high eighties and nineties on internal consistency and test re-test checks. The scales have been validated against known criterion groups, faculty ratings, correlations with other scales, and observed phenomena.

[46] The preceding and ensuing discussion of change in the subjects of the study is taken largely from chapters VI., "Values and Attitudes Four Years After College," and VII., "Conditions of Change," of *Beyond High School;* see also chapter IX, "Education for Adulthood: Some Conclusions," Tables 1–3, while based on the data in *Beyond High School,* were taken from *The Research Reporter,* a quarterly bulletin of the Center for Research and Development in Higher Education, Volume III, number 1, 1968. These tables enable one to grasp more quickly the results discussed than do the much more complex tables of the actual study.

TABLE 1.—*Change on the nonauthoritarianism scale of the OPI from 1959 to 1963 by post-high school activity*

	Mean score [1]	
	1959	1963
College men	46½	52½
College women	44½	52½
Employed men	43	42½
Employed women	41	40½
Housewives	42½	41

Approximate.

Those who score high on this measure are characterized by flexibility, tolerance, objectivity, and a lack of dependency upon rules or rituals for dealing with ideas, objects, and people. Low scorers are more rigid and conventional in their thinking, tending to see more situations in black or white fashion.

In amount of change, the withdrawals were more like the non-attendees than the persisters, therefore the type of personality development measured continues to be associated with persistence in college beyond the early years. This was true regardless of level of ability or socioeconomic status. As seen in Table 1, just prior to high school graduation the mean nonauthoritarianism score of the college-bound men was a little over three standard points higher than their male classmates who went to work. By 1963 the difference in mean scores between the two groups spanned over ten standard points, or more than a whole standard deviation. Over the four years, the college men's mean score increased by six points while the employed men's mean score decreased by one point. Note that the difference between the womens' groups is even greater.

Table 2 shows the Thinking Introversion scores for the several groups. According to the OPI, the Thinking Introversion Scale is a measure of general appreciation of, and interest in, scholarly activity. High scorers are characterized by a liking for reflective thought; their thinking tends not to be dominated by external conditions and generally accepted ideas, but rather by an interest in ideas for their own sake. Low scorers tend to evaluate ideas for their practical, immediate application.

The male college withdrawals on the Thinking Introversion Scale, starting from a lower mean score than the persisters, changed about as much in thinking introversion as the persisters did. The two groups were about as far apart after four years as when first tested. The female withdrawals changed insignificantly in thinking introversion score.

TABLE 2.—*Change on the thinking introversion scale of the OPI from 1959 to 1963 by post-high school activity*

	Mean score [1]	
	1959	1963
College men	48½	51½
College women	50½	53½
Employed men	41½	43½
Employed women	43½	43
Housewives	44½	43

[1] Approximate.

TABLE 3.—*Change on the complexity scale of the OPI from 1959 to 1963 by post-high school activity*

	Mean score [1]	
	1959	1963
College men	50½	51
College women	49	50½
Employed men	51	48½
Employed women	46½	44½
Housewives	49½	45

[1] Approximate.

The Complexity scale is essentially a measure of intellectual curiosity and general perceptual orientation. High scorers are tolerant of ambiguities, respond to a greater variety of environmental stimulation, and are fond of novel situations and ideas; low scorers prefer sure, simple, and structured situations.

Scores on the Nonauthoritarianism and Complexity Scales showed that there is a clear tendency for the experience of full-time employment, and especially early marriage combined with full-time homemaking, towards a constriction of flexibility, autonomy, intellectual curiosity, interest in new experiences, and tolerance for ambiguity.

On the average, the college persisters increased their mean nonauthoritarianism scores by nearly seven standard points, and the withdrawals by three points. The persisters increased their mean scores on the Social Maturity Scale by 9.8 standard points, and the withdrawals by 5.4 points.

The authors note that without scores from intermittent tests it cannot be proven that the students increased in autonomy in direct proportion to the length of their exposure to college. However, the students who persisted in college longer had the greatest change in level of autonomy, since the college students with four years in college, and those with less, had obtained the same scores on the Social Maturity Scale when they were high school seniors. This evidence does not necessarily contradict previous studies that the greatest change of values of college students occurs during the first two years. In the study under discussion, however, the difference in change is greater between the persisters and withdrawals than it is between the withdrawals and the non-attendees. Trent and Medsker believe these differences are too great to dismiss the strong possibility that the persisters in college continued to develop all through college in a way that the withdrawals did not.

The authors of *Beyond High School* broke their sample into three change groups to further examine the extent of measured change, and to search for those factors that bear on whether and how young adults change their attitudes as they go from high school into college, work, or home. These three groups were called the exceptional, negative, and average changers. The exceptional and negative change groups each contained about 25 percent of the sample, and the average group the remaining 50 percent. The exceptional and negative changers were defined as those who fell three-fourths or more of a standard deviation from the mean in scores on the Social Maturity Scale (SM) of the OPI. The average change group therefore was those whose scores fell within three-fourths of a standard deviation above or below the average change score on the SM Scale.

The trait of autonomy as revealed by the SM Scale was singled out because it was found to distinguish between college persisters, withdrawals, and non-attendees, in change of attitude, as much or more than any other variable in the study. As a reflection of objective, independent, flexible and open-minded thinking, autonomy appears to be crucial to the satisfactory development and maturation of the age group under consideration.

Table 4 shows the attitude of the change groups to education. Note that the exceptional changers value education the most and placed the most value on an intellectual approach to education.

TABLE 4.—*Educational orientation of college persisters and the consistently employed of each change group, in percentages*

Pursuit and opinion	Change groups			Chi square
	Exceptional	Average	Negative	
College:				
(Number)	(500)	(624)	(176)	
Graduation from college very important	90	89	87	1. 28+
Attendance at graduate school likely	54	48	49	4. 10+
Most important purpose of education—knowledge and ideas	47	40	35	9. 40**
Employed:				
(Number)	(149)	(487)	(285)	
Graduation from college very important	28	25	21	3. 00+
Attendance at graduate school likely	11	9	10	0. 51+
Most important purpose of education—knowledge and ideas	15	22	15	7. 59*

+p=not significant.
*p<.05.
**p<.01.

TABLE 5.—*Majors of the college change groups, 1963*

[In percent]

Major	College change groups		
	Exceptional (N=500)	Average (N=624)	Negative (N=176)
Applied:			
Education	33	53	14
Engineering	34	50	16
Medical science	41	46	13
Business	39	48	13
Forestry/agriculture	13	60	27
Academic:			
Natural science	34	51	15
Social science	44	43	13
Humanities/arts	44	44	12

Major subjects reported by the students in 1963 also helped to distinguish the change groups. Social science and humanities majors had the most exceptional changers, and education, engineering, natural tional changers. A plausible conclusion therefore would be that colscience, and especially forestry-agriculture had the fewest exceptional changers. A plausible conclusion therefore would be that collges or universities enrolling large numbers of majors in forestry-agriculture, education, engineering, and natural science could not expect as much change in its students as an institution enrolling many students inclined to the humanities and social sciences. The former would be true of many public colleges and universities. This result of the Trent-Medsker study casts further doubt on the worth of Ph. D. productivity as a measure of institutional quality.

As we have seen, personality development took place most among the college persisters, then among the withdrawals, then the employed youths, and least of all the girls who immediately became full-time housewives. Trent and Medsker, however, point out some general reservations about their results: the several groups, true, were distinguished by measured intellectual orientation, "but many of the differences were more statistical than remarkable, particularly when level of ability and socioeconomic status were held constant." The college students as a whole did not possess a high degree of intellectuality and autonomy. Their personality scores were high after four years of college only in comparison to those who had less college or none. On the basis of responses to questionnaires and interviews "they (college students) could be judged to be largely apathetic to intellectual inquiry and social issues." Except for a much increased interest in news magazines, the college students' reading habits were not especially intellectually oriented nor especially different from the reading interests of the other youths. The college persisters, however, were far more esthetically oriented than the other groups.

Type of higher educational institution seemed to make little difference: The college students changed to about the same degree regardless of the type of college they entered. (See Table 6).

TABLE 6.—*Standard mean nonauthoritarianism and social maturity scores of college students, 1959 and 1963, by type of college attended in 1963*

	College			University		
	Public	Church-related	Private nonsectarian	Public	Church-related	Private nonsectarian
Men (N)	(214)	(114)	(37)	(250)	(39)	(31)
Nonauthoritarianism:						
1959	45.48	45.44	49.54	46.51	42.92	54.48
1963	52.49	51.46	52.42	53.17	47.69	53.45
Difference	7.01	6.02	2.88	6.66	4.77	−1.03
(*t*)	[1] (8.87)	[1] (6.40)	[2] (1.61)	[1] (11.48)	[1] (3.73)	[2] (.53)
Social maturity:						
1959	52.79	52.43	52.43	54.23	50.85	60.27
1963	62.31	61.54	64.80	63.87	56.89	64.93
Difference	9.52	9.11	12.37	9.64	6.04	4.66
(*t*)	[1] (14.21)	[1] (11.83)	[1] (10.76)	[1] (18.19)	[1] (4.76)	[1] (3.05)
Women (N)	(203)	(107)	(27)	(190)	(22)	(21)
Nonauthoritarianism:						
1959	43.31	43.06	44.38	46.80	41.57	47.01
1963	52.60	51.21	53.49	53.88	46.12	57.01
Difference	9.29	8.15	9.11	7.08	4.55	10.00
(*t*)	[1] (11.91)	[1] (8.86)	[1] (4.05)	[1] (8.53)	[3] (2.19)	[1] (5.59)
Social maturity:						
1959	51.64	50.34	55.77	55.22	48.70	59.40
1963	62.50	59.12	65.98	66.57	56.96	69.63
Difference	10.86	8.78	10.21	11.35	8.26	10.23
(*t*)	[1] (16.97)	[1] (11.71)	[1] (5.29)	[1] (18.31)	[1] (3.53)	[1] (6.24)

[1] p=<.01.
[2] p=not significant.
[3] p=<.05.

Men and women in the private non-sectarian colleges and universities entered college with the least authoritarianism, and students who entered church-related institutions with the most—except for two-year college students, who are not shown in the table. The results on the SM scale were essentially the same. The private non-denominational college and university men had the highest initial scores on the NA scale, but failed to expand their scores in relation to the other college groups. The authors note that institutions renowned for their academic excellence were not examined separately and that this might make a difference. The institutions were not distinguished according to size, special program, ability of faculty or ability distribution of their students.

Trent and Medsker argue that the attitude changes observed in their study cannot be a reflection of general maturation of young people because of the relative lack of development found among the non-college students and the withdrawals. But it is possible that the changes found result in large part from the students' readiness for growth and the colleges' facilitation of that growth. The specific catalysts for change have yet to be identified, however. "The specific impact of college on students remains unclear . . ."

Astin and Panos, in a study shortly to be published, have attempted to determine the "value added" by institutions to their students.[47] They adjusted for differential student input through obtained scores on the National Merit Scholarship Qualifying Test and obtained Graduate Record Examination (GRE) area test scores for a sample of 669 students at 38 institutions. The 669 students were distributed fairly evenly among the 38 colleges and universities: the maximum was 49 with a median of 16 and a mean of 17.6 students per college. There were so few students per college because they had to be among the 250 or so students at each of 248 colleges in a sample from an earlier study by Astin. Only 38 of the 248 colleges had participated in the GRE area testing program in 1965.

Student input data were obtained from the National Merit Scholarship Corporation and a brief questionnaire administered in 1961. Data from these sources were used to generate 103 student input measures; in addition 69 college environment characteristics were obtained. The measures of intellectual achievement used were the students' scores on the area tests. The three area tests were administered by the Educational Testing Service as part of its Institutional Testing Program, and cover the social and natural sciences and humanities. Conditions of participation in this program require that all seniors take the area tests.

The authors concluded, after an elaborate regression analysis, that "variations in achievement during the senior year in college were much more dependent upon differences in student characteristics that existed prior to matriculation than they were upon the characteristics of the colleges attend by the students." The analysis, however, accounted for only about half of the observed variation in student achievement. The authors feel that a large proportion of this residual variation is undoubtedly attributable to errors in their measuring instruments, but it is also possible, they believe, that they have failed to identify other important environmental factors. They also state that it would have been desirable to collect a wider range of information about the student's personality, attitudes, values and behavior for studies of institutional impact on students, but they decided to limit their questions to those directly related to educational achievement and career plans.

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[47] Alexander W. Astin and Robert J. Panos, *The Educational and Vocational Development of American College Students*. This study will be published by the American Council on Education. An article adapted from chapter 3 of the book has been published in *Science*, 16 August, 1968, pp. 661–668.

Astin and Panos feel that due to the results of their study, it might be wise to re-examine traditional notions about college excellence. Towards the end of their book, however, the authors seem to express reservations about their own conclusions: "These findings indicate that in future studies of differential college influence, it may be necessary to employ measures of college characteristics that are 'tailor made' to the particular outcomes being studied. Otherwise, it may not be possible to account for differential college effects in terms of measurable attributes of the institutions." The authors' reservations, and their recommendations for future study by tailoring measures to particular institutions, agree with Trent's and Medsker's similar conclusion that such tailoring may have to be done in order to show differential institutional impact on students—see the above discussion of *Beyond High School.*

Another recent analysis of between college effects on students' cognitive achievement found that while 85 to 90 percent of the between college variance in student achievement was predictable from student input, a small but significant portion of the remaining variance was due to characteristics of the institutions rather than their students.[48] Rock, Centra, and Linn, of the Educational Testing Service (ETS), using a larger sample of colleges and students than did Astin and Panos, were able to use the institution as the sampling unit and thus could partition the between college variance after allowing for student input. Astin and Panos, because of the small number of students at each college in their sample, had to partition the total individual variance. The ETS study comprised 95 colleges that had administered the GRE area tests in 1967 or 1968. SAT scores were found for 6,855 of the seniors at these colleges, for an average of 71 students at each of the 95 colleges. Astin and Panos had a maximum of 49 students per college in their sample, but the average was much less. After a regression analysis, and using the GRE institutional mean scores as output and the SAT institutional mean scores as input, Rock, Centra, and Linn concluded that 10 to 15 percent of the between college output variance could not be predicted from the input measures. A small but significant part of this remaining variance could be predicted from income per student, proportion of faculty with a doctorate, full-time equivalency of the student body, and the interaction of these three variables with the GRE-Natural Science, GRE-Humanities, and GRE-Total scores, but not with the GRE-Social Science score. But as the authors point out, the college effects, even though larger than those found by Astin and Panos, are of limited practical significance.

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[48] Donald A. Rock, John A. Centra, and Robert L. Linn: "The Identification and Evaluation of College Effects on Student Achievement," unpublished paper, January 1969. The authors are research psychologists at the Educational Testing Service, Princeton, New Jersey, and performed this study with a contract from the U.S. Office of Education.

There are a number of limitations to consider for the ETS study, however. The sample of colleges was not representative of the total population of colleges: in particular there were few large universities, State supported colleges, or engineering schools. The elite private institutions of the northeast were particularly lacking. The authors feel that more refined measures of income, expenditures, and faculty characteristics are needed in order to show differential college impact on students. Another restriction is the narrow nature of the criterion used to measure college effectiveness—the GRE area tests. These tests measure only a part of what can be called the output or (product) of a college, and that part is limited to the cognitive. But liberal arts colleges are at least as much concerned with developmental change in their students—the affective rather than the cognitive. These kinds of values and attitudes are not measured by cognitive achievement tests, thus the area tests may not be suitable for measuring between college variance of the most important aims of these colleges.

Within college changes were beyond the scope of the ETS study, but it is quite possible that colleges may be differentially effective with different kinds of students, but these effects need not show up in the institutional mean scores. And, most importantly, the authors of the ETS study believe that variables more directly concerned with the nature and extent of student-faculty interactions would be particularly relevant. It is these interactions that are so important for stimulating developmental change in students, but these kinds of changes will not show up in achievement tests.

The Astin-Panos and ETS studies sought to measure the impact of college on students through cognitive achievement tests. This brings us to the question of whether cognitive tests, achievement, or grades can be used to determine the impact of college on students. Without considering any problems in the use of aptitude and achievement tests, or grades, for the evaluation of individual students, the prospects of using such tests to determine the effect of college on students, or as a means of discrimination between colleges, do not appear to be fruitful.

Tests of academic potential or cognitive achievement probably represent only a partial description of the likelihood of real-life accomplishment in those professions requiring above average mental ability. For example, the relationship between verbal intelligence and creativity is curvilinear, but at about 120 I.Q. the slope of the curve drops sharply so that the two variables, while still correlated, are less so than at lower points in the I.Q. range.[49] Studies of creative people by Donald MacKinnon, director of the Institute of Personality Assessment and Research at Berkeley, support the above observations. MacKinnon tested groups of mathematicians, architects, and research scientists who were nominated by their peers as being creative, and who were patently successful in their careers. He could not find any significant difference in I.Q. between his sub-samples characterized by different levels of creativeness. Successful careers in these fields seem to require an I.Q. of about 120. The I.Q. range in his sample of 140 creatives in the above professions ranged from 114 to 152 with only one above 145 and two below 118; 98 percent were between 118 and 140. MacKinnon concludes that "above a certain minimum level required for mastery of a field, being more intelligent does not guarantee a corresponding increase in creativeness." [50]

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[49] Gerald P. Ginsburg and Robert G. Whittemore, "Creativity and Verbal Ability: A Direct Examination of Their Relationship," *The British Journal of Educational Psychology,* June 1968, Vol. 38, Part 2, pp. 133–139.

The Massachusetts Institute of Technology began a testing program in 1961 to try to determine the level of creativity among its entering freshmen. All entering freshmen were given three scales from the OPI—Thinking Introversion, Complexity, and Impulse Expression. High scorers on these scales generally prefer to try out new solutions to problems, like to fool around with ideas, and prefer to take cognitive risks. The MIT researchers also discovered that these high scoring students are more likely to leave the Institute—by withdrawal or disqualification—than the low scoring students. (The scholastic aptitude scores and secondary school academic preparation of both high and low scorers seemed to be negatively correlated.) The low scorers tended to remain in one program for their entire time at the Institute, especially the engineers. The low scorers on the Impulse Expression Scale had a significantly higher final cumulative grade average than the high score Impulse Expression group. It appeared that the greater the impulse restriction the higher the grade. The major loss of high creativity students occurred in the first one and a half years, and those who remained took academic paths different from their less creative peers: for example—only one sixth of the seniors as a whole were in science, but one half of the high scorers were in science—as opposed to engineering.[51] This conclusion corroborates the low frequency of engineers among the high changers in *Beyond High School.*

Personality testing is not without problems, but the questions dealt with are very complex, and answers cannot wait until all methodological issues are solved. In the long run, however, psychological testing may be the most promising method to measure change in students and the impact of college on students, as well as discriminating between colleges. But, see the caution about the use of personality scales in: Harold A. Korn, "Personality Scale Changes From the Freshman Year to the Senior Year," p. 184, in *No Time for Youth*, by Joseph Katz and associates, San Francisco, 1968.

What then are the possibilities for beneficial, developmental change in college students? Trent and Medsker believe that a state of readiness is crucial to personality development in college. They feel that it is quite conceivable that the subsequent development of the new college freshman rests more on his predisposition toward change than any other trait or factor in the environment. There is evidence, Trent and Medsker believe, that the orientation of the student's parents toward higher education constitutes a key factor in determining whether a child's disposition toward learning will be positive or negative. They cite their own evidence, however, in pointing out that college does influence students—the distinct relationship their data showed between persistence in college and change in attitudes and values.

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[50] Donald W. MacKinnon, "Education for Creativity, a Modern Myth?" in the book of the same title edited by Paul Heist, Center for Research and Development in Higher Education, University of California, Berkeley, 1967.

[51] The paper on MIT is by Benson R. Snyder: "How Creative Students Fare in Science," in *Education for Creativity, A Modern Myth?*, edited by Paul Heist.

Freedman in his new book, *The College Experience*, believes that systematic personality change does occur in college. He believes that his and others' work have shown that this development is "not simply a matter of progression along lines laid down in early adolescence or in infancy." "Late adolescence may well prove to be as important for the adult personality as the developmental phases of infancy and early adolescence."

But what has the general slant of the evidence shown us so far? One must conclude that the experience of college does not exert a profound influence on most students. A few students are so affected in many colleges and a few colleges deeply reach a lot of their students.

Theodore Newcomb's study of Bennington College in the 1930's, and his follow-up study 25 years later, demonstrates a sustained college impact on students that cannot be attributed only to student input.[52] In his original researches with the PEP Scale (see above) Newcomb found that the longer students remained in college the less conservative their attitudes became. For the alumnae of the 1930's, the political point of view which characterized them as seniors still fairly accurately characterized them in 1960–61. Changes in college tended to persist. For those alumnae who did not graduate the general trend is the same, but there are more exceptions to the trend. Since the dropouts, in their last college tests, did not differ significantly in their PEP scores from those who remained to graduate, Newcomb concludes that continued college experience had a "deconservatizing" effect and that this effect lasted.[53]

As a further verification of the influence of the college environment, Newcomb hit on what David Riesman called "the ingenious idea" of comparing Bennington alumnae with their sisters who did not go to Bennington. Newcomb reports that: "The 1964 responses showed that Bennington graduates resembled non-siblings who were also graduates more closely than they resembled their own sisters who were non-graduates." Newcomb believes this to be further evidence of the durable impact of the college.

But Bennington is only one small college, and a college that is generally agreed to be superior.[54] What of other colleges and other students?

Nevitt Sanford, in describing the Mellon Foundation studies at Vassar College, and the differences between freshmen and seniors at Vassar, says that we are dealing with a problem which has an important statistical aspect. If we talk about the whole student body at Vassar then we would have to affirm Philip Jacob's results—there is only small beneficial change in basic values and attitudes overall. But when the Vassar freshmen were compared with the seniors the differences were quite striking.[55] Sanford feels that the students who were effectively "reached" by the college cannot be pointed out by proportion, since he is talking statistically, but that even if it were only one in five that would be enough to make a striking statistical difference between seniors and freshmen—which he believes they had at Vassar. Sanford feels that a college teacher would be happy to "reach" one in five students and that anything that would be true of one in five would be very important. Not much happens to most students, he agrees, not enough happens to the average student.

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[52] The original study was Theodore M. Newcomb, *Personality and Social Change*, New York, 1943. The second book is by Newcomb, Kathryn E. Koenig, Richard Flacks, and Donald P. Warwick, *Persistence and Change: Bennington College and Its Students After Twenty-Five Years*, New York, 1967.

[53] As an interesting check on validity, the attitude scores obtained from the alumnae respondents about their fellow aumnae friends and from those friends themselves tend to be congruent.

[54] David Riesman has pointed out "That Bennington is the least academically selective of the leading women's colleges" with less than half of its applicants graduating in the top fifth of their secondary school classes. Developmental change induced by the college experience is not limited therefore to only the very top of secondary school graduates. Riesman's comment is taken from his review of Newcomb's *et al* study of Bennington College in *The American Journal of Sociology*, March 1968, Volume 73, No. 5, pp. 628–630.

Many critics of higher education were bothered by the small amount of change produced in students, seeing this as an indication of the ineffectiveness of colleges. Freedman, however, believes that this reaction can go too far, and that it "is a misperception of the way in which social change takes place." "The key to social change," Freedman believes, "is that, in a dynamic system, slight changes in individuals can lead to profound changes in the system as a whole." "Massive social change is compounded out of slight shifts in individual attitudes and beliefs."[56] The civil rights, anti-Vietnam war, and other campus protests he thinks are partly the fruits of this change.

David Riesman believes that "The lack of specific impact of colleges today on many of their students is a tribute to their *general* effectiveness." "The middle-brow culture of America has been decisively influenced by academic values, both through attendance at college and spread of 'collegiate' values through the major networks, the Luce and similar publications, professional and business conventions, and in-service training." Riesman speaks of "this new situation which is the result of wirespread cultural advance."[57] Similarly, the Berkeley sociologist Martin Trow believes that the outcry over the quality of college teaching is somewhat misplaced: The quality of college teaching is not declining, but is continually improving—the dismay really comes, perhaps, from higher standards now more widely applied.[58] The colleges get steadily better Riesman believes, and he feels that if Jacob had done his study twenty years earlier, he would have found even less emancipation in the colleges than he did. Sanford concurs, and adds that compared to the best colleges of the nineteenth century, the average college of today is a stronghold of serious scholarships.[59]

IV. THE INFLUENCE OF THE ENVIRONMENT

Many observers have remarked the seeming eagerness of freshmen entering college: they are usually unsophisticated, but appear open and ready for new experience. Just what is in store for them, they are not always sure, but they expect, and partly fear, a challenge.

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[55] *Spotlight on The College Student*, edited by Margaret L. Habein, Washington, D.C., 1959. (A discussion by the Problems and Policies Committee of the American Council on Education, led by David Riesman, Philip E. Jacob, and Nevitt Sanford. This discussion was prompted by the publication of the "Jacob Report" and the early results of the Vassar studies.

[56] Freedman, *The College Experience*, p. 5.

[57] In "The Jacob Report" a review article of *Changing Values in College*, in the *American Sociological Review*, vol. 23, 1958, pp. 732–738.

[58] Martin Trow, "The Idea of a New University," in *Universities Quarterly*, March 1965, pp. 162–172. Trow does believe that there has been a real decline in the extent and quality of the personal relations between students and staff in the larger institutions.

[59] In *Spotlight*, pp. 9 and 52.

The Vassar College studies have shown, however, that the "prime concern of most entering freshmen, although often not a matter of explicit or conscious knowledge, it with acceptance by their fellow students." Their greatest *conscious* anxiety is educational or intellectual concerns.[60] Theodore Newcomb, writing of his uncompleted researches at the University of Michigan, says that their work has already shown how many freshmen "quickly team up with others much like themselves, and we do not expect to find much value change within existing peer groups formed in such ways, our assumption being that their members will tend to reinforce one another's existing values." Newcomb believes his results will demonstrate a general phenomenon, of which fraternities and sororities are merely a special case, in that such groups tend to select homogeneous recruits and insulate them from influences that might induce significant attitude change.[61]

Wallace's study of "Midwest College" has examined the processes by which students entering this college (a small mid-west liberal arts college) learn how the local campus culture views academic achievement and graduate training. The entering students learned the local campus culture within the first two or three months of residence. The new students quickly grasp the nature of the local expectations and norms and rapidly adjust to them; by the end of the freshman year they are not distinguishable from upper-classmen in their espoused values about academic achievement.[62]

The student culture the freshmen enter has qualities of personality, ways of social interaction, and types of values and beliefs, which are passed on from one generation to another, and like any culture provides the basic context in which individual learning takes place. The authors of the Vassar studies contend that this culture is the chief educational force at work in the College, since being assimilated into the student society is the prime concern for new students. In their opinion, the academic objectives and processes of the College are mediated for the new students by the student culture, or by the predominant culture, since colleges usually have several student cultures.

Any changes in the students are by compromise between the explicit goals of the College and its faculty, and the student culture, which defends itself against too radical an encroachment upon its habits and mores. (As compared to freshmen, nevertheless, the seniors are "liberated" in the direction of the College's aims of a liberal education.) Except for a minority of students, the intellectual goals of the College "do not enter primarily into the formation of the central values and habits of the students." "Instead, for most students, educational experiences are assimilated to a central core of values and dispositions which is relatively independent of the more formal academic influences." [63]

Studies of the socialization process in different kinds of organizations and institutions have shown that even within formal organizations (such as a college) with specific socialization roles, much of the socialization still occurs through informal processes, outside the specified roles.[64] The primary group (in this case, students) often is the main agency of socialization within formal organizations. These peer or group relationships may influence the outcome of socialization by engendering resistance to or subversion of the socializing process (in higher education, the aims of the college). The collectivity of students can develop a unity, a sense of group identity, a power to act, thus influencing the socializing agent's objectives and techniques by organizing resistance of some kind. The participants in a socialization sequence may pass on information to the newer members which enables them to manipulate in their own interest the socializing agent or agency, thus to interfere with the planned process.[65]

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[60] Freedman, "The Passage Through College," p. 17.

[61] Theodore M. Newcomb, "Research on Student Characteristics: Current Approaches," in *The Student in Higher Education*, American Council on Education, Washington, D.C., 1965, p. 60.

[62] Walter L. Wallace, *Student Culture, Social Structure and Continuity in a Liberal Arts College*, Chicago, 1966.

[63] From Freedman, "The Passage Through College."

Sanford says that the results of recent studies leave no doubt that what students learn in college is determined in large measure by their fellow students, that is by the norms of behavior, attitudes, and values that prevail in the peer groups to which they belong. Not all students accept the prevailing student culture, and others grow away from it, but by definition, a majority of the students are participating more or less fully in this culture.[66]

The mediating effect of the student culture and its values can be seen in a study comparing faculty rankings of nine educational objectives with student rankings, at the University of New Hampshire. The faculty ranked educational growth first in importance, but the students placed it fourth. The students gave first place to vocational preparation. The faculty gave the lowest rank to "the degree" and social growth, but the students placed informal intellectual activity with peers and student-faculty relationships last. When the senior rankings of these objectives were compared with the freshmen rankings there was no closer agreement with the faculty objectives.[67]

At most colleges, the evidence indicates that the prestigeful student leaders, and student organizations generally, maintained values strongly opposed to those of the faculty and were able to counter faculty influence to a large extent. Often, the anti- or non-intellectual and less liberal norms of the students and their institutions are supported by organizations beyond the college: alumni and national fraternity groups, and sometimes politicians or trustees with control over the college or university.[68]

Colleges are not comprised of homogeneous student cultures. Although there may be a prevailing culture at any particular college most institutions will be made up of several subcultures of students. Clark and Trow have developed a useful and influential model of four types of student subcultures. They call these four basic types of subcultures the academic, collegiate, vocational, and nonconformist.[69]

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[64] Although socialization plays a major part in the development of personality, the two terms are not synonymous. Socialization is the process whereby a person learns to get along with, and to behave like, others in his group or culture.

[65] Taken from Brim, "Socialization Trough the Life Cycle."

[66] Nevitt Sanford, *"Where Colleges Fail, A Study of the Student as a Person,* San Francisco, 1967, p. 148.

[67] Cited by Webster, Freedman, and Heist, "Personality Changes in College Students," p. 836, in *The American College.*

[68] Barton, *Studying the Effects of College Education,* pp. 60–61.

The *vocational* culture emphasizes education essentially as preparation for an occupational future. The social or intellectual aspects of college life, although not ignored, are less important. The *academic* culture, while not ignoring career preparation, gives emphasis to the pursuit of knowledge, ideas and scholarship. The *collegiate* culture places greatest value on the extracurricular side of college life. The *nonconformist* culture ignores or disdains the extracurricular life of the college, and either rejects commonly held value orientations in favor of one's own or has not yet really decided what to value and is searching for meaning in life. This culture is often deeply involved with ideas and art forms both in class and out.[70]

FIGURE 1

		Involved with ideas	
		Much	Little
Identify with their college	Much	Academic	Collegiate
	Little	Nonconformist	Vocational

Types of Orientations of Four Most Distinguishable Student Subcultures

The vocational culture flourishes when the steadily increasing numbers of students from working class and lower middle class origins go, as many of them do, to large institutions that do not have a strong intellectual tradition. Students of upper class and upper middle class families can afford the "luxury" of an interest in ideas as they can also afford the luxury of a collegiate fun culture. Which way the latter students go depends on the intellectual climate in their homes, their own academic abilities, their experience with ideas, occupational aspirations, and the kind of college they enter.[71] As skills and formal knowledge grow in importance, and as more and more lower class students go to college, the vocational and academic orientations grow at the expense of the collegiate culture. The collegiate culture is in no danger of extinction, especially on what Trow calls its large state preserves,[72] but the demands of cold war, government, and business for managerial and technical expertise are strengthening the academic and vocational cultures.

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[69] Burton R. Clark and Martin Trow, "The Organizational Context" in *College Peer Groups, Problems and Prospects for Research,* edited by Theodore M. Newcomb and Everett K. Wilson, Chicago, 1966. Clark and Trow caution that their types of subcultures are not necessarily types of students, even though they often describe these subcultures by characterizing their members. Any particular student may participate in more than one of the subcultures on his campus, though in most cases one subculture will embody his dominant orientation. Also, the actual subcultures on any given campus may comprise elements of more than one of these types.

[70] This description of the four student cultures is adapted from Richard E. Peterson, *On a Typology of College Students,* 1965, a Research Bulletin of the Educational Testing Service, Princeton, N.J. Peterson has used the Clark-Trow model in his research on students.

[71] Clark and Trow, *"Organizational Context,"* p. 28.

[72] F. Scott Fitzgerald's famous quip is still true at such institutions: fountains of knowledge where students gather to drink.

Richard E. Peterson of the Educational Testing Service has surveyed by questionnaire about 13,000 entering freshmen at 23 colleges and universities to try and determine the distribution of students among the four cultures of the Clark-Trow analytical model. Peterson's survey questionnaire was administered in September 1963 at the 23 institutions which, while not systematically drawn to be closely representative of the total population of college freshmen, do broadly constitute a fair approximation of American higher education at the four year college level (no junior colleges).

Included were four state universities, five state colleges, one private university, four independent coeducational colleges, two womens' colleges, three Roman Catholic controlled colleges, three technical institutes, and one military service academy. Except at one public university, the entire entering class at each institution completed the questionnaire. The table below shows the distribution of the entire sample and the distribution at four selected institutions.[73]

TABLE 7.—*Proportions of freshmen classified as vocational, academic, collegiate, and nonconformist (percent)*

	Total sample (N=12,949)	Technical institute (N=236)	Private university (N=171)	State college (N=727)	Womens' college (N=110)
Vocational	27	48	33	21	7
Academic	19	14	33	12	47
Collegiate	51	34	29	64	15
Nonconformist	4	2	2	2	31

Although Peterson does not identify the above four institutions, internal evidence in his report reveals that Bennington is the women's college. Newcomb's researches at that college enable us to see the several student cultures at one highly regarded college.

At Bennington, the upperclassmen, and especially the prestigeful student leaders, have assimilated the very liberal attitudes of the faculty, and serve as a powerful reinforcement to faculty influence. Unlike the dissonnance between students and faculty at most colleges, at Bennington the values and attitudes of most students are congruent with those of the faculty and the aims of the college. As Barton declared, "The whole college system exerted pressure in one general direction."[74] This is the environment confronted by the new students each year.

Newcomb has developed a typology of student cultures at Bennington which resembles the Clark-Trow typology.[75]

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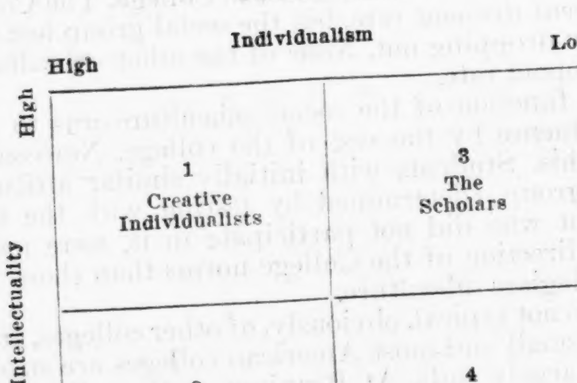
[73] The table is from Peterson, *Some Biographical and Attitudinal Characteristics of Entering College Freshmen: A Summary Report of a Questionnaire Survey*, a Research Bulletin of the Educational Testing Service, Princeton, 1964 (revised 1965), p. 7.

[74] Barton, *Studying the Effects of College Education*, p. 60.

[75] The typology was actually developed by Richard Flacks, one of Newcomb's co-authors of *Persistence and Change: Bennington College and Its Students After Twenty-five Years*, New York, 1967.

FIGURE 2



There are also two smaller subcultures at Bennington, the campus leaders and political activists, but these are not necessarily independent of the big four. The social group is equivalent to the collegiate culture of Clark and Trow, while the scholars correspond to the academic culture. The culture Flacks calls the "wild ones" most closely parallels Clark's and Trow's nonconformists. The creative individualists comprise a student type that probably does not exist at most other colleges in enough numbers to form a subculture, but it is the presence of these students with their high individuality and high intellectuality that gives Bennington much of its special character.[76]

It is the social group, or collegiate subculture, that I will pay most attention to since that culture comprises half the students in Peterson's sample and clearly dominated the public college (64%). The difference between the collegiate subculture at Bennington and other well-studied schools, such as Vassar, is that at Bennington the collegiate subculture is deviant rather than dominant. At Vassar, the collegiate type tends to dominate; the intellectuals and nonconformists form closely knit subgroups or drop out. At Bennington the pattern is reversed.[77]

The function of the social subculture at Bennington was to enable relatively conventional and unintellectual students to remain at the college while successfully avoiding substantial disruption of their basic values and style of life. The social students associated with each other, they chose each other as friends, and tended to concentrate in particular residence houses. Without participation in the deviant subculture such resistance to the College norms would have been much more difficult and perhaps impossible had the student remained in the College. The social group nevertheless had a higher dropout rate than any of the other subcultures in the College. The College average was a ten percent dropout rate, but the social group lost 24 percent of its members by dropping out. None of the other subcultures exceeded the average dropout rate.

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[76] Bennington also has, of course, much larger academic and nonconformist cultures than most other colleges, and does not have a vocational culture worthy of the name.

[77] Newcomb, *Persistence and Change*, p. 191. All of the Bennington discussion is taken from this book.

The central function of the social subculture was to facilitate resistance to influence by the rest of the college. Newcomb's findings clearly show this. Students with initially similar attitudes to those in the social group (determined by testing with the OPI and by interviews), but who did not participate in it, were more likely to change in the direction of the College norms than those who participated in the collegiate subculture.

Bennington is not typical, obviously, of other colleges. It is typical in one way—it is small and most American colleges are small, but there the similarity largely ends. At Bennington, the college has captured the campus standards of conformity and has made them work for its own ends, but at the large university or college, especially the large public institution, the kinds of students and the highly transient nature of the student body virtually precludes the possibility, as Clark and Trow point out, of strong academic subcultures. Whereas at the "elite" private college 75 to 90 percent of the students will graduate in the prescribed four years, at state universities only 30 to 60 percent will do so. There are some state colleges, e.g., in California, that lose more than 80 percent of their students in the first *two* years.[78] The typical length of stay in the public junior colleges is less than that. This rapid turnover affects the content and the viability of subcultures. So too does the interest of the students: the big three vocational curricula: business administration, engineering, and education account for about half of all undergraduate degrees. Peterson found that 47 percent of the students in his sample were anticipating a major in business, engineering, education or some other vocational specialty.[79] This large turnover of students, combined with a vocational or collegiate attitude by students, is not conducive to the developing of a vigorous intellectual life. Neither does the mass processing of students at large institutions encourage a serious concern with ideas on the part of most students.

Vocationalism encourages the growth in size and complexity of academic institutions. Business associations, professional organizations, and other interest groups see the college as a training center and urge them to proliferate occupational curricula. And, of course, students seeking upward mobility look for occupational training in a host of fields. As Peterson discovered, the typical student in the vocational culture is from a working class or lower middle class home and has a narrowly instrumental view of education.

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[78] Clark and Trow were not trying to single out California for criticism: at the time of their writing the above they were both members of the sociology department at Berkeley and associated with the Center for Research and Development in Higher Education located at that university. See "Organizational Context," pp. 58–59. In Minnesota, of the high ability men who entered state colleges in 1952, only 47 percent had graduated by 1956; but 73 percent of the men enrolled in private coeducational colleges had graduated by 1956. See George D. Yonge, "Students," in the *Review of Educational Research,* October 1965, pp. 256–257.

[79] Peterson, *Some Biographical and Attitudinal Characteristics,* p. 3.

Sanford found in his studies of Vassar, Berkeley, and Stanford that institutional coherence and the strength of the student peer culture vary inversely. When the students are faced with fragmentation among the adults, they turn to each other.[80] Bigness of institution itself, whether fragmented or not, affects the student's view of the college or university. Riesman describes how James Coleman clarified for him, on the basis of his studies of high school value climates, "how in a big school the faculty appears to the students as a monolithic entity, and vice versa, even if the student-teacher ratio is as favorable as at a small college—the differences are analogous to those between the large and small print shops discussed in S. M. Lipset, Martin Trow, and James S. Coleman, *Union Democracy*, Glencoe, Illinois, 1956".[81]

Newcomb believes that we cannot understand how students adapt to the experience of college on the basis of individual predispositions alone; therefore, we need to place such predispositions in the context of the larger student culture and social structure. The relationship between individual attitudes and the dominant normative structure of a college is a means to understanding how students respond to the college.[82] But college environments differ sharply, and we need to know not only how colleges affect students, but also what kinds of students do well in what sort of colleges.

Pace and Stern have developed a College Characteristics Index (CCI), which is a scale that attempts to characterize the influences and interrelationships of colleges and their students. Stern has also developed an Activities Index (AI) which is a counterpart for the individual student of the CCI. The AI attempts to measure the extent to which a student's disposition or needs are congruent or dissonant to the climate of a college. The CCI, which was first published in 1958,[83] consists of 300 statements about college life: features and facilities, faculty, rules and procedures, curricula, teaching, extracurricular life, students' interests and values, etc., which may or may not be true of any particular college. Observers, usually students, are asked to indicate whether or not each item correctly describes their college. Scores are averaged across observers to find the mean score for an instituiton. Norms have been developed for the CCI so that results for a single college show the extent to which its environment differs from the norm group. A factor analysis has shown that most of the CCI variables can be grouped under four major headings: (1) an intellectual-humanistic-esthetic cluster or emphasis, (2) a cluster suggesting emphasis on independence, change, and science, (3) an emphasis on personal and interpersonal status, coupled with a practical or vocational orientation, and (4) an emphasis on group welfare, social responsibility, and a well-manned community.

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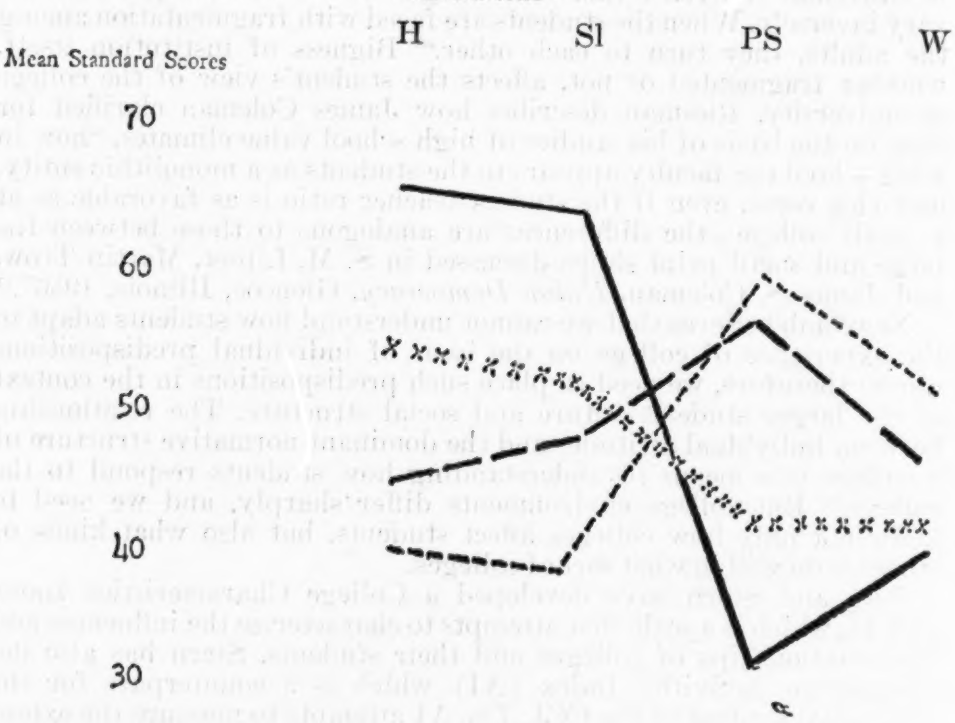
[80] Nevitt, Sanford, *Where Colleges Fail*, p. 178.

[81] David Riesman, "The Jacob Report," p. 738, footnote.

[82] Newcomb, *Persistence and Change*, p. 192.

[83] See C. R. Pace and G. G. Stern, "An Approach to the Measurement of Psychological Characteristics of College Environments," in the *Journal of Educational Psychology*, vol. 49, 1958, pp. 269–277.

FIGURE 3.—*Profile of San Francisco State compared with three other types of institutions*



Standard Score Scale: Mean=50, Sigma=20.

H=Humanism, Understanding, Reflectiveness, Sentience, Objectivity, Energy, Achievement.

Sl=Scientism, Change, Fantasied Achievement, relative absence of close Supervision and Order.

PS=Practicality, Dominance, Abasement, Play, Sex.

W=Nurturance, Succorance, Affiliation, Conjunctivity.

——— Seven high prestige private Liberal Arts colleges (Antioch, Bennington, Oberlin, Reed, Sarah Lawrence, Vassar, Wesleyan).

— — Twelve large universities, public and private (Arkansas, Buffalo, Detroit, Emory, Florida State, Illinois, Kentucky, Michigan, Minnesota, Purdue, Rhode Island, Syracuse).

– – – Five schools of education (Ball State Teachers College, Buffalo State College, Fayetteville State Teachers College, Morgan State College, St. Cloud State College).

x x x SF State College.

Note: Differences between institutions within the category of prestige liberal arts colleges and within the category of schools of education are relatively small. All colleges within the category follow the same pattern. In the University group, however, there are large differences between institutions, so that all institutions do not follow the pattern that is defined by the mean for the group. For example, Michigan is much higher on the Humanistic cluster than any other University in the group; both Michigan and Minnesota rank considerably above the others in the Independent-Scientific cluster. On the group welfare cluster, the score for Florida State is much higher than for the other Universities.

An example of the application of the CCI to one institution is in Figure 3 where San Francisco State College is compared with three groups of institutions. The profile for SFSC runs along the mean score, and compared to these institutions it occupies an area between the large universities and the prestige liberal arts colleges. Note that the profile of the liberal arts colleges is almost a complete reverse to that of the teachers' colleges.[84] A college administrator can look at this profile and see how his college compares to other institutions in qualities he may be striving to attain or to avoid.

While the CCI attempts to measure the total characteristics of a college, as seen by the students, these are the external pressures or "press" of the environment. The AI attempts to measure students' psychological needs by having them respond to a scale describing commonplace daily activities of colleges. The student then records his like or dislike of these activities.

Stern has published the results of the application of the CCI and AI to 75 colleges and universities; these are all the institutions for which CCI and/or AI data were available as of 1961–62.[85] They are a large and diversified, but not an especially representative group of schools. On the CCI scale for intellectual climate, 11 colleges ranked one standard deviation or more above the mean (Stern calls these schools as high in intellectual climate) 11 fell one standard deviation or more below the mean (low intellectual climate) and 53 were within one standard deviation above or below the mean (middle intellectual climate). Stern says none of the 11 colleges one standard deviation below the mean of his distribution are known for academic excellence. The 11 colleges ranked high were:

Antioch C.
Bennington C.
Bryn Mawr C.
Goddard C.
Oberlin C.
Reed C.
Sarah Lawrence C.
Shimer C.
Swarthmore C.
Vassar C.
Wesleyan U.

Although all these colleges are known to be highly selective, expensive, and of high quality, Stern says that "it does not follow that the student responses on which these scores are based are a reflection of their reputation rather than their actual present status." "Several other schools listed should have received similarly high scores if this were the case, but neither of the two most obvious exceptions are even in the upper third of the distribution." (Stern does not name the bottom 11 schools). Stern also shows correlations between the CCI intellectual climate score and several other measures of academic quality (see table 8).

TABLE 8.—*Correlations between intellectual climate score (CCI) and other measures of academic quality*

	n	r
Knapp-Greenbaum index, "scholars" per 1,000	50	0.80
Percent grads receiving Ph. D , 1936–56	37	.76
Percent merit scholar entrants, 1956	41	.49
Merit scholars per 1,000, 1960	25	.59
National merit scholarship qualifying test means	38	.71
College board means:		
Verbal	16	.83
Mathematical	16	.34

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[84] This brief description of the CCI is taken from "Methods of Describing College Cultures," by C. Robert Pace, in the *Teachers College Record*, January 1962, pp. 267–277. The CCI has since been shortened and simplified into The College and University Environment Scales (CUES).

[85] George G. Stern, "Characteristics of the Intellectual Climate in College Environments," *Harvard Educational Review*, Winter 1963, pp. 5–41.

The percentage of National Merit Scholar Finalists among entering students does not correlate very well (r=.49); Stern suggests that either these awards are not a good index of scholarly potential, or that these students do not choose colleges as appropriately as they might. (See the earlier discussion of Heist, *et al*, "Personality and Scholarship," which demonstrated that NMSC winners and near winners differed substantially in their intellectual orientations, and selected colleges of high or low Ph. D. productivity based on these varying personality traits.) Stern feels that the very high correlation with the SAT verbal score indicates that these colleges select students more carefully than students choose their colleges.

From the above relationships, Stern feels that the intellectual climate of a college is closely related to the quality of its students and to their academic achievements after the baccalaureate. But the distinctive character of these top 11 schools "is associated to some degree with institutional processes which are independent of the particular attitudes of the students who attend them." I think that Stern understates the case for faculty and administrative influence in the nature of the intellectual climate. Of 25 items which Stern lists as most clearly depicting the high intellectual climate schools, 12 of these items can be attributed to quality of faculty, or administrative policy; 12 of the items can be scored as student attributes; one item is shared by both students and faculty-administration. The faculty and administration items (in my judgment) range from "Faculty members put a lot of energy and enthusiasm into their teaching" to "Student organizations are not closely supervised to guard against mistakes." The student attributes items range from "A student who insists on analyzing and classifying art and music is not likely to be regarded as odd" to "There is much studying here over the weekends, but students frequently do things on the spur of the moment."

On the basis of Stern's own items, then, I would say that the characteristics of a high intellectual climate would have to be divided evenly between attributes of the students and attributes of the faculty and administration. These 25 items were answered in the same way by 90.8 percent or more of 1,156 students in the top 11 schools. The 25 items with the highest consensus from 773 respondents at the 11 schools lowest in intellectual climate start at 79.8 percent of the sample. Stern believes there is somewhat less consensus at these low schools, perhaps because of their size and diversity.[86] Of the 25 high consensus items at the low intellectual climate schools, only seven items can be clearly attributed to the faculty or administration; two items appear to be shared by both students and the faculty-administration, and the rest are characteristics of the students. According to Stern, a high intellectual emphasis in a college is not just a function of its students' orientation towards scholarship: "An absence of staff preoccupation with student custodial care is another important factor." "A suitable climate in which the intellect can flourish seems to require a large measure of space in which growth can occur." Stern found that the majority of the schools he studied with the CCI and AI had high scores for various aspects of constraint and dependency. The denominational colleges were the most extreme in their emphasis on conformity, and the "elite" private liberal arts colleges were least so.[87] The students in the latter colleges seek self-expression vigorously and the faculty and administration respect their integrity and their efforts.

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[86] The 25 items depicting the low intellectual climate vary from "Books dealing with psychological problems or personal values are rarely read or discussed" to "There is little emphasis on preparing for graduate work."

Stern sums up his evaluation of the intellectual climate by pointing out that an unpublished study by H. E. Berquist at the University of Chicago "indicates that schools with a strong intellectual climate get students with strong intellectual needs, and some other kinds of students as well, whereas the schools with a weak intellectual climate only get the other kinds."

A much different picture from the top colleges emerges in Stern's analysis of personal relationships at the low schools. Students at these colleges felt closer personal ties, accepted authority from others, and were eager to assume it for themselves. These traits, Stern feels, are similar to the dynamics of business executives analyzed by Henry. The emotional constraint of the students at low colleges is also consonant with Henry's findings.[88]

Stern also compares administrative and organizational differences between his high and low schools: size, location, control, programs, faculty, and finances. There are almost no surprises here: The top schools are small, the bottom average nine times larger; the high schools tend to be in the northeast and middlewest and are not usually in large cities; the low colleges are predominantly metropolitan, averaging 560,000 people per site, compared to the top schools' average of 12,000 if Reed College is omitted—the only high college in a large city; the high colleges are all private and non-denominational, whereas the low colleges tend to be public. (Of the eleven low colleges, four were non-accredited, very small, very poor institutions; Stern eliminated them from this comparison.) The low schools (and the middle ones) were academically more complex, offering a variety of technical and occupational programs as well as more traditional academic programs; but the high schools were all liberal arts colleges. The high schools had much more favorable faculty-student ratios—one to eight—and one full-time instructor to every ten students; but the low schools had one instructor to 15 students, and one full-time instructor to every 27 students. Two-thirds of the full-time high faculties were Ph. D.'s but only one third of the full-time low faculties were; at the high schools 84 percent of the faculty were full-time compared to 54 percent at the lows. Salary comparisons were not possible because none of the low schools would authorize release of their salary figures as reported to the AAUP, but by some juggling Stern concluded that no very great disparity in salary is to be expected between top and bottom schools. Salaries brings us to finances, and finances brought the only surprise of these comparisons.

The financial assets of the top colleges were substantially greater than the lows when totals were translated into average dollars per student. Current income per student at the high colleges averaged 3,377 dollars per student, but only 1,000 dollars per student at the low schools. But money alone is not the determining factor. The highest scoring college on the list actually had *less* income per student than one of the eleven low scoring schools. The top college is a very highly regarded small liberal arts college with about 700 students and a faculty of 71; the low school (actually sixth from the bottom, picked because the two schools' financial standing was so similar) enrolls about 3,000 students and has a faculty of 261. It is a small state university and land-grant college (see table 9). The income of the two schools is distributed in essentially the same way, except that one is heavily dependent on student fees and the other on state appropriations. These two colleges have the same amount of dollars per student available to them, but this money is spent "in ways which provide very different educational facilities as these have been described to us by their student bodies via the CCI." [89]

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[87] David Riesman in his perceptive little essay: "Bookworms and the Social Soil," in *Individualism Reconsidered,* Glencoe, Illinois, 1954, points out how people of genuine intellectual interests need to create a kind of "social space" around themselves, an area of privacy. This is, at least in part, what Stern is referring to. Riesman also notes (in *Spotlight*—see above) that Jacob found a great deal of autonomy at Harvard (one of Jacob's "potent" colleges) and it is this autonomy which permits academic "ratebusters" and intellectual or artistic enthusiasts to go "unpunished" by their fellow students.

[88] See William E. Henry, "The Business Executive: The Psychodynamics of a Social Role," *The American Journal of Sociology,* January 1949, pp. 286–291.

TABLE 9.—*Sources of income for 2 schools*[1] *selected from opposite extremes of the intellectual climate score*

	Per school				Per student [2]		Per full-time faculty [3]	
	High	Percent	Low	Percent	High	Low	High	Low
Total current income	$1,373,447	100.0	$6,350,030	100.0	$1,968	$2,097	$19,338	$24,327
Educational and general	961,959	70.0	[4] 4,835,573	76.2	1,378	1,597	13,544	18,525
Student fees only	672,828	(50.0)	879,968	(13.9)	964	291	9,473	3,371
Auxiliary enterprises	355,074	25.9	1,284,221	20.2	509	424	4,999	4,920
Student aid income	5,419	.4	38,984	.6	8	13	76	149
Contract research and services	50,995	3.7	191,252	3.0	73	63	718	733

[1] The high school has the highest score on the intellectual climate distribution; the low school is 6th from the bottom. The 2 were chosen for comparison because their relative financial standing is so similar.

[2] High, 698; low, 3,028.

[3] High, 71; low, 261.

[4] Includes $3,725,563 in State appropriations.

Stern believes that when 85 percent or more of the respondents at a college respond the same way to an item of the CCI or AI, then we can be confident that they have revealed something of themselves as a group or of the college as a learning environment. The image obtained this way is not an interpretation nor an impression, Stern feels, but the collective perception of the participants.

The CCI and AI have been criticized nonetheless because both sets of measures are usually derived from the same students. Thus the students' own characteristics may modify their perceptions of the college environment, and to the extent that the college modifies student characteristics, the interaction is already expressed in the CCI and AI measures, thus when the CCI and AI results are compared the results may be artificial.[90] Stern does not accept this criticism. Although the same students may serve as sources for both press (CCI) and needs (AI) data there is no relationship, he declares, between the needs preferences a student records for himself and the press characteristics he attributes to the college, either at the same college or across colleges. Stern refers to a study by McFee that used a sample of psychology students at one college to show that there was no correlation between CCI scores and the parallel scores on the AI.[91] Yonge, nevertheless, will not accept these results as a demonstration that the CCI and AI provide independent measures, since McFee "ignored the question of possible correlations among nonparallel scores derived from these two tests." Since McFee's results are not compelling, says Yonge, Stern's data are ambiguous to the extent that students with varying needs perceive their environments differently.[92]

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[89] How money is deployed probably makes more difference than the actual amount of money. See, for example, Henry S. Dyer, "School Factors and Equal Educational Opportunity," *Harvard Educational Review*, Volume 38, No. 1, Winter 1968, pp. 38–56.

[90] George D. Yonge, "Students" in the *Review of Educational Research*, October 1965, pp. 258–259.

[91] Anne McFee, "The Relationship of Students' Needs to Their Perceptions of a College Environment," *Journal of Educational Psychology*, February 1961, pp. 25–29.

David Riesman also has stated some reservations about the CCI. He feels that Pace and Stern are trying to measure college environments by the anthropological approach—using students as informants rather than as respondents, but the data are still analyzed in psychological terms. Riesman points out that this method may work better with a college that is relatively homogeneous and where one is primarily interested in the students' ideology about the college. Not all students are equally influential either in determining the climate or the local legends about it. Few students, if any, he adds, are aware of the full impact of college on them, along with and in contradiction to other agencies of socialization.[93] Yonge feels that these methodological questions render some of the results and interpretations of the Pace and Stern studies ambiguous. Nonetheless, he believes that these are pioneering studies which are providing great contributions to knowledge about the impact of college on students, for they have shifted the research emphasis from a descriptive to a dynamic model.[94]

V. THE ACHIEVEMENT OF EDUCATIONAL EFFECTIVENESS

Joseph Katz and his associates, in their extensive study of Berkeley and Stanford undergraduates, found that about a quarter of the students ranked intellectual and artistic activities among their first three preferred activities; a quarter also said that courses or teachers, and the ideas presented by them, had great influence upon them.[95] As noted earlier, Peterson determined that about 19 percent of the students surveyed with his questionnaire could be placed in the academic culture, and about 4 percent in the nonconformist culture. The latter usually have a strong interest in ideas and art-forms, and together with students in the academic culture would total about 23 percent of students with some sort of a basic interest in ideas and an intellectual orientation to life.

In *Beyond High School*, Trent and Medsker placed about one-fourth of their subjects (mostly college persisters) in their "exceptional change" category: those who fell at least three-quarters of a standard deviation above the mean change score. These students also had the most intellectual approach to education, valuing education for itself rather than some utilitarian or instrumental attitude toward college.

Nevitt Sanford, in his discussion of students with Philip Jacob and David Riesman, felt that the Vassar studies showed perhaps 20 percent of the students were being effectively "reached" by the college, and helped on their way to significant developmental change and personality growth as well as intellectual achievement.

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[92] Yonge, "Students," p. 258.

[93] David Riesman, "Comment," in Newcomb and Wilson: *College Peer Groups*, p. 270.

[94] Yonge, "Students," p. 259.

[95] "Four Years of Growth, Conflict, and Compliance," by Joseph Katz in *No Time For Youth*, Joseph Katz *et al*, San Francisco, 1968, p. 23. Katz thinks 25 percent may be high, since students often "pretend to more involvement—even to themselves—than they really have."

These conclusions indicate that perhaps 20 to 25 percent of the students in college can be expected to show significant change and an intellectual orientation towards life and education. The fact that about three-fourths of college students, even in good colleges, show relatively little intellectual interest and no more change or development should not be surprising from what we have observed in parts three and four above. Katz says that, "As one conducts interviews," (of the Berkeley and Stanford students in his study) "what strikes one about many students is the relative passivity with which they view life." [96] Sanford believes that the passivity of most students is due to the "good-natured resistance of student peer cultures." [97] Freedman feels that the majority of students are "unsophisticated, conventional, and stable, rather more in need of being stirred up than calmed down . . ." [98] "In an educational institution today," Harold Webster declares, "the complacency, dependence upon parental values, and lack of mental disturbance among large numbers of students is itself a cause for disturbance among educators; such placid students are in many cases very nearly uneducable." [99] Trent and Medsker in *Beyond High School* found that there was "no case to be made for the existence of any prevailing stand of student nonconformity or dissent. The evidence once again points to the opposite conclusion." [100] The Vassar College study found that many of the students avoided serious commitments to an intellectual life or discipline because they felt that marriage and commitment to a discipline were incompatible.[101]

This passive attitude towards life and education is the real enemy of change and intellectual development in students, for it appears that without internal conflict little change and development is possible. Katz reports that his analysis of the Berkeley and Stanford students who showed a high degree of development in college also showed a higher degree of inner conflict and turmoil. Katz believes that conflict and development go together. The students who experienced more conflict than their peers in college also engaged more in creative activities and changed more in their personal characteristics, in their moral and political views, and developed more freedom to express feelings and desires. The students with a history of conflict attributed greater influence to ideas in books they read on their own. They also were less active in social activities then their peers.[102] Sanford believes that "in order to induce desirable change—toward further growth or development or toward greater health—we have to think in terms of what would upset the existing equilibrium, produce instability, set in motion activity leading to stabilization on a higher level." [103] Without this production of instability in the student followed by the restoration of stability, but on a higher level leading to further exploration and conflict, personality development will not be likely to occur. It is this "constant balancing of stability and change that characterizes personality development in college." [104]

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[96] Katz "Four Years of Growth," p. 5.

[97] Sanford, *Where Colleges Fail*, p. 148.

[98] Freedman, *The College Experience*, p. xiii.

[99] Webster, "Some Quantitative Results," pp. 35–36.

[100] *Beyond High School*, p. 297.

[101] Freedman, "The Passage Through College," pp. 26–27.

[102] Katz, "Four Years of Growth," pp. 12–13.

[103] Quoted in Katz *et al*, *No Time For Youth*, p. 74.

[104] Peter Madison, "Dynamics of Development and Constraint: Two Case Studies," in Katz *et al*, *No Time For Youth*, p. 75.

Real education and emotional conflict within the student appear to go together, but for education to do its work there must be an openness on the part of the student, a predisposition for change. Sanford says the Vassar studies have shown that freshmen at Vassar arrive with high ideals and high expectations, want to be challenged, and want something to happen to them. It doesn't take long, however, to dissipate the students' enthusiasm as a result of their dealings with the college bureaucracy, being divided among the departments, of being pulled hither and yon by all sorts of requirements. With their contacts with the other students the freshmen quickly learn the ropes in manipulating the situation.[105] The same theme is developed by Katz in his recent book; he reports that many of the Berkeley and Stanford freshmen, and the upperclassmen in retrospect, in their interviews asserted "that they came to the university with high intellectual expectations, only to find them stifled not just by the academic requirements and the nature of many courses, but also by the anti-intellectual attitudes of their fellow students." [106] Student complaints about the lack of intellectuality of other students were so frequent that Katz feels some of those complaining must be among those complained about. Katz explains this by suggesting an absence of curricular or other effective arrangements to respond to this apparent intellectual willingness by the students. The students sometimes expressed liking of readings or admitted to participating in intellectual or artistic activities which they would not admit to their peers. Katz feels that peer pressures were against such involvements thereby explaining the students' reticence about them to other students and why students were critical of others. Also "the incongruity between what is presented in the classroom and the student's own intellectual inclination and phase of cognitive-affective development make intellectual involvement difficult." Students expect to be stimulated, and when they are not stimulated by the academic environment, but that environment makes them feel that they should be more interested than they are, then they feel guilty. "Not surprisingly," Katz says, "this guilt may be projected onto others: the others are not intellectually interested; one would do better oneself if only the others were more interested." [107]

The intellectual eagerness of the freshmen does not have a secure base, Katz believes, but if it did, it would not be so easily discouraged by either peer resistance or by incongruity of the faculty. "The spark is there early in the freshman year, but we fail to use it. The psychological potency of the moment of entrance to college is worth much further exploration." [108]

The evidence from the Vassar, Berkeley, and Stanford studies shows that the students initially are eager and willing, but this eagerness is quickly dissipated, unless the predisposition to change is strong, by the student peer culture's resistance to influence by the aims of the college, or by those aims being insufficiently expressed by the college. The predisposition to change in students is fundamentally important, after that it is the nature of the college environment which will determine how much students will grow and change. These personal qualities or traits of the student are, of course, not independent of the student's background.

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[105] From Stanford's discussion in *Spotlight*, pp. 81–82.
[106] Katz, "Four Years of Growth," p. 28.
[107] Katz, "Four Years of Growth," pp. 28–29.
[108] Katz, "Four Years of Growth," p. 29.

Webster, Freedman, and Heist report that research has shown that most new students are enthusiastic about college, but:

> very few have developed those psychological characteristics that will permit them the necessary freedom within the college culture, and within the larger culture, to become seriously committed to intellectual and esthetic problems. As a result, few will become interested in learning for its own sake. For example, few students have the kind of personal autonomy, or independence, or even, perhaps, the social alienation that permits them to defer for long their vocational or marital aims in the interest of following other pursuits. The majority of students soon forgo experimentation with roles, and any questioning of basic values, in order to secure as soon as possible a relatively definite plan for the work of the future.[109]

The authors think that this "pervasive caution," the intellectual passivity that most students soon lapse into, "may be due in part to the absence of conflict during the pre-college years." They point out that contrary to general belief, the Vassar studies showed that there was little evidence that adolescence for these girls had been a time of turmoil or rebellion; their most common crises during secondary school was an occasional fear about acceptance by peers. They cite other evidence to support their view of emotional quietude among pre-college adolescents.[110]

There is evidence that the high schools contribute much to the absence of conflict in students which seems to be so important for their intellectual passivity then and later in college. The high schools by and large do not serve to bring students to a point where there is a basic and lasting predisposition for change on the part of students. Neither do high schools encourage or award outstanding academic achievement on the part of students.

James S. Coleman has analyzed the student value climates of ten high schools, and concludes that the relative unimportance of academic achievement in these schools "suggests that these adolescent subcultures are generally deterrents to academic achievement."[111] Coleman examined the status systems of the student cultures in the ten schools to see the effects of these status systems upon the students. The ten schools ranged in size from 180 students to 2,000, from a town of less than one thousand to over a million, and from poor to affluent suburb. The similarities of the student status systems "were far more striking than the differences." Coleman blames the overwhelming importance of the boys' interscholastic athletics. Athletic achievement was the prime way to gain status in school; in the predominantly middle-class school it was by far the most effective route for a working class boy to be admitted to "the leading crowd." Although the alternatives for the girls are different, in every school the girls—although better students—want even less than the boys to be considered as "brilliant students." In all the schools Coleman examined, academic achievement was of less importance than such matters as being an athletic star for boys, or being a cheerleader or "good-looking" for girls, or other attributes.

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[109] "Personality Changes in College Students," p. 839.

[110] "Personality Changes in College Students," pp. 839–840.

[111] "The Adolescent Subculture and Academic Achievement" in *The American Journal of Sociology*, January 1960. pp. 337–347. Coleman's studies of high school value climates are reported at length in *The Adolescent Society*, New York, 1961.

Coleman noted a perverse effect caused by the student peer cultures' aloofness to academic excellence: the boys who received the best grades were not the most able academically. The boys defined as the best students by themselves and others were actually a mediocre few. The ones with the most intellectual ability, "knowing where the social rewards lie, will be off cultivating other fields which bring social rewards." The "students with ability are led to achieve (academically) only when there are social rewards, primarily from their peers, for doing so . . ." The same syndrome appears true in college, less strongly perhaps, but still pervasive enough at most colleges to enable only the odd deviant or those with strong intellectual interests to avoid the value orientations of the peer culture or to grow away from it.

The high schools, Coleman feels, allow the student subcultures to divert their energies into athletics and social activities, and therefore attract into intellectual activities students of a "mediocre level of ability." In fact, he believes, the schools actually help the students to do so.

Coleman points out the high school with more than twice as many students going on to college (about 80 percent) than any other school in his sample; the parents of the students in this school were professionals and business executives and live in an upper-middle-class suburb, "yet academic excellence counted for little among" these students.

In addition, Coleman examined two private coeducational day schools which drew students from backgrounds similar to the school just mentioned. The private schools, however, showed much greater variation from the ideal of the athletic star. In Coleman's graphs, these two schools, for the boys, stood extremely far from the cluster of the other schools, in the direction of the brilliant student ideal, with a pull towards a social image—the most popular. All ten of the public schools were clustered together and pulled toward the athletic star. The responses for the girls were intermingled with those of the public schools with their principal female attractions of activities leader or most popular.

Coleman explains the clustering of the public high schools, and the divergence of the private schools, to be caused by interscholastic athletics. The public high schools are all hotly engaged in interscholastic leagues which are bound together in state tournaments.[112] The private schools, while having interscholastic sports, play only scattered private schools, are weakly organized in a league, have little publicity and play in no city or state tournaments. Coleman feels that the reduced importance of sports in the two private schools allows the status system at these schools to " 'wander' freely, depending on local conditions in the schools."

The public school and its community are closely bound together in this athletic rivalry; they must devote the same attention to athletics as the neighboring schools and towns. Sports are the way a school generates identification and cohesion, for this is the activity in which the school participates as a school and represents its community. "It is as consequence of this," Coleman feels, "that the athlete gains so much status: he is doing something for the school and the community, not only for himself, in leading his team to victory, for it is a school victory."[113] But the student who wants to excel academically can bring little or no glory to his school, and his accomplishments, almost wholly personal, often bring disapprobation as a "curve-raiser" or "grind," or as Riesman would say, accused of being a "rate buster."

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[112] The one Roman Catholic high school in Coleman's sample exhibited a pattern similar to the public schools.

A more recent study of the effects of high schools on the academic behavior of their students reinforces Coleman's conclusions.[114] McDill, Meyers, and Rigsby obtained data from a national sample of 20 public high schools in 1964 and 1965. The schools were in eight states, varied widely in community and socioeconomic characteristics, size (from 240 students to more than 2,400), and showed considerable variation in academic performance and climates. The authors declare that their "results strongly suggest that the individual student's academic behavior is influenced not only by the motivating force of his home environment, scholastic ability, and academic values but also by the social pressures applied by other participants in the school setting." They believe their findings provide a direct assessment of the effects of high school normative climates on the academic performance of their students. The authors feel that in those schools where the faculty and students emphasize and reward academic competition, intellectualism, and subject-matter competence "individual students tend to conform to the scholastic norms of the majority and achieve at a higher level."

In Coleman's study, the public high schools, no matter where located or how much money they had, were all like slices of the same pie: the crust varied a little in color, lumps, and bumps, but the taste is the same. The product of high school is bland enough that, for the most part, colleges will have to do their own shaking up of students in order to create a challenge, and the crucial predisposition for change, upon the part of their students if they are to have much impact on them.

Freedman is undoubtedly correct when he writes that with the large numbers of youth attending college now, youth will make a much better world if colleges furnish adequate leadership, but it will require a sharper and deeper impact of college experience on the student than has been usual.[115] One way that colleges can achieve a much deeper impact on the student is through the old Socratic principle of wisdom: "to know thyself." Nevitt Sanford says that Lawrence Kubie cogently argues "that educators must find some way to lead students to that 'self-knowledge in depth' that is sometimes attained in the consulting room."[116] (Sanford is *not* suggesting that all or most students should have psychotherapy.) The unconscious processes have such an enormous implication for the student's future, Sanford believes, that the most important step in the development of entering students is to make these processes conscious, thus permitting the educational process to do its work. In Kubie's view, according to Sanford, the colleges ought to take the chance to reduce the number of their graduates who have cut off their chances of fulfillment and who therefore injure themselves or others as well.

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[113] One is reminded of the annual Indiana high school basketball phenomenon known as "Hoosier Hysteria."

[114] Edward L. McDill, Edmund D. Meyers, Jr., Leo C. Rigsby: "Institutional Effects on the Academic Behavior of High School Students," in *Sociology of Education*, Summer, 1967, pp. 181–199.

[115] *The College Experience*, p. 10.

[116] Sanford, *Education for Individual Development*, p. 22, an unpublished paper prepared for the Office of Education of the U.S. Dept. of Health, Education, and Welfare, Washington, D.C., 1967, for the "New Dimensions in Higher Education" series. Kubie's original article is "The Forgotten Man of Education," *Harvard Alumni Bulletin*, February 1954.

But for those students who are ready for it, an effective college can do much to bring the student far along the way of developmental change. The readiness and predisposition for change are crucial, however. The kinds of responses desired in college cannot be made unless certain preconditions have already been built up in the student. For most students this is just not the case. There is a flicker of this readiness at the time of college entrance but only for a small minority of students, at least at most colleges, will it last. As Sanford points out: "The condition of readiness is necessary to further development (of the freshman) but it is not a sufficient cause of such development. The personality does not just unfold or mature according to a plan of nature. Whatever the stage of readiness in the personality, further development will not occur until stimuli arrive to upset the existing equilibrium and require fresh adaptation. What the state of readiness means most essentially is that the individual is now open to new kinds of stimuli and prepared to deal with them in an adaptive way." [117]

To be effective, therefore, colleges need students who are emotionally ready and predisposed to change, by either finding students who are ready or by "upsetting" and challenging them sufficiently so that they will become ready for education to do its work. A college must also be good enough to keep its students in a state of readiness—this may be harder to do than to find such students.

Although some believe that excellence in a college is achieved more through the students it selects rather than what the college does to them, McConnell and Heist believe that, "A more fruitful hypothesis . . . would seem to be that the efficacy of a college is the product of the fortunate conjunction of student characteristics and expectations, *and* the demands, sanctions, and opportunities of the college environment and its subcultures." [118] What Philip Jacob found in his "potent" colleges meets that hypothesis.

Several attributes were found to occur at all of the colleges Jacob described as having a "peculiar potency" or educational effectiveness. These colleges all seemed to have "a high level of expectancy of their students." What is expected is not necessarily the same at each college: for some it may be outstanding intellectual initiative, for others it may be a sense of social justice, or open-mindedness, or dedication to humanitarian service. Everyone in the college, however, is consciously aware of the mission and aims to which the college is dedicated. "Where there is such unity and vigor of expectation, students seem drawn to live up to the college standard, even if it means quite a wrench from their previous ways of thought, or a break with the prevailing values of students elsewhere." [119]

George Stern says that the results of his latest work on college cultures shows those well known and highly regarded liberal arts colleges such as Swarthmore, Reed, Wesleyan and others, are more "intellectual" than their students, who then "strain" to live up to the norms, but at the large university, although the students are often less intellectual than those at the liberal arts colleges, they tend to be more intellectual than their environment demands of them. These students then may become demoralized and restless. Stern attributes some student disturbances to this effect.[120] As in Joseph Katz's discussion of students at Berkeley and Stanford, students at those two universities frequently complained about the lack of intellectualism in their environments.

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[117] Nevitt Sanford, "Developmental Status of the Entering Freshman," in *The American College,* p. 258.

[118] T. R. McConnell and Paul Heist, "The Diverse College Student Population," in *The American College,* p. 250. Heist and McConnell are testing their hypothesis in a long-term study of eight colleges and universities under the auspices of the Berkeley Center for Research and Development in Higher Education.

[119] Jacob, *Changing Values,* p. 9.

Similarly, Astin and Panos reported that only about 20 percent of the students in their survey felt that intellectual was very descriptive of their college, and 16 percent said that description did not apply at all. The rest said "in-between" was descriptive of their college.[121] In *Beyond High School* about one-third of the college persisters (and about one-fifth of the withdrawals) felt that the administration and faculty treated students more like children than adults. About 30 percent of the college persisters (and about one-third of the withdrawals) felt that most of the faculty at their college were not intellectually stimulating.[122] Once again, however, we see the shortcomings of not "tailoring" this kind of inquiry to particular institutions, or at least by size, type, and control of institution. The usefulness of this particular data from the Astin and Panos and Trent and Medsker studies is, therefore, limited.

Those colleges which have developed a high level of expectancy of their students, as Jacob points out, acquire a "personality" in the eyes of their students, alumni, and faculty. The students do not see everything alike, but most come to a similar concern for the values held important by the college.[123]

Whether any given student will actively respond to the educational influences of a college depends on whether the college has, as Jacob puts it, "captured control of the campus standards of conformity, and made *its* values the ones by which the student community measures success and acceptability." [124] (This is just what Bennington College, for example, has done.)

Changing the nature of the student peer culture is difficult, but it can be done. Private colleges can alter the colleges' image by vigorous recruitment and selection, but this option is not usually available to public institutions. Any college can try to bring the peer culture more into harmony with the aims of the college. The student culture can either be changed by deliberate action of the college or it can be enlisted into the service of at least some of the purposes of the college and faculty. If high prestige becomes attached to intellectual excellence then the students' need to belong will stimulate the students' academic motivation. Any college can try to develop a student-faculty subculture that could be based upon a particular experimental program or philosophical outlook.[125] Student peer groups can be used to help attain educational aims by dovetailing college or sub-college membership, living groups, and classroom experience.[126]

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[120] George G. Stern, personal communication.

[121] Astin and Panos, *American College Students*, Ch. II, p. 22 and table 20.

[122] Trent and Medsker, *Beyond High School*, p. 296 and table 8–9.

[123] Jacob, *Changing Values*, pp. 9–10. Jacob believes that a climate favorable to value redirection has appeared most often at the "private colleges of modest enrollment;" sometimes, however, this kind of a value climate occurs within a particular school or division of a large public university.

[124] Jacob, *Changing Values*, p. 121.

[125] Sanford, *Where Colleges Fail*, p. 152.

A recent study of the influence the Harvard houses have on Harvard undergraduates (eight houses, about 400 students each) shows the effect of sub-college combinations of living and study experience. Student values and attitudes changed in the direction of the house goals. The extent of this change was most apparent where the goals of both master and staff converged, and where there was much student peer involvement in the house. The extent of change was also related to the degree of consensus between staff and students.[127]

These kinds of approaches are seeking not so much to change the students inclination to conformity, but are trying to exploit it in the interest of the aims and purposes of faculty and college policy. As Sanford points out, however, changing the nature of the peer culture is not enough. Since we want students to develop as individuals, we must free students, as much as we can, from the claims of any peer culture. But if colleges want to change their students' values in some more intellectual and socially responsible way, they must set values for students to emulate. As Sanford so aptly puts it: "The college must worry not only about its curriculum but about the values it lives by, the example it sets." The college must manage its own affairs based on values that are known to the students and worthy of emulation by them. "The extraordinary thing," Sanford declares, "is how often this minimum requirement is lacking in colleges and universities today, perhaps especially in universities." "In these large institutions, students seldom are confronted directly with models of the responsibility we would like them to develop; and faculty members seldom demonstrate for them a sense of loyalty to the purposes of the whole institution." [128]

David Riesman, in his review-article of Jacob's book, said that in spite of complexities within the outlook of American faculty members, there have been very few studies of college faculties. Riesman believes that Jacob had not really accepted that a strong minority of faculty members at leading colleges believe that college should only give intellectual training, and not try to form a community not to alter students' values. "The university today," Riesman continues, "more I would think than big business, is a refuge for individualists and entrepreneurs who tend to shun explicit commitment to communal or collegiate values other than those implicit in their own discipline or in a religion of science." [129]

Support for Riesman's belief is the recently published study of "Hawthorn College," a new (1959), small non-residential college within a large state university in an industrial city in the midwest. Hawthorn (apparently Monteith College of Wayne State University), while not selecting students of special academic aptitudes, was designed to be a demanding college, emphasizing general education, non-vocational therefore, and trying to overcome the problems of public universities: largeness, anonymity, and overspecialization.

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[126] Freedman, "The Student and Campus Climates of Learning," p. 40, and see Newcomb, "Student Peer-Group Influence" in *The American College*.

[127] Rebecca Vreeland and Charles Bidwell, "Organizational Effects on Student Attitudes: A Study of the Harvard Houses" in *Sociology of Education*, vol. 38, 1965, pp. 233–250.

[128] Sanford, *Where Colleges Fail*, pp. 74–75, 152.

[129] Riesman, "The Jacob Report," p. 734. Talcott Parsons and Gerald M. Platt, with the financial support of the National Science Foundation, are engaged in an extensive study of the American academic profession. This is a systematic attempt to relate academic man to academic life, and uses a sample of 127 four-year colleges equal to 10 percent of the population.

Faculty conceptions of students, educational objectives, student-faculty relations, and educational effects were to be studied. The college faculty is made up of three broad departments: social sciences, natural sciences, and humanities; but the humanities staff, since it was smaller and newer, was not included in the report under discussion although it was included in the research.[130] The two departments of social and natural sciences at Hawthorn developed different conceptions and norms of the students, the College, and the faculty role. The natural scientists held a utilitarian view of the College, but the social scientists had a normative attitude. The natural scientists, for example, wanted the students to be committed enough to the College in order to meet academic demands, "but that it was not necessary—and frequently undesirable—for students to be more strongly committed to Hawthorn." The social scientists, however, believed that it would take a high commitment by the students in order to meet faculty goals.

The natural scientists maintained the traditional separation between students and faculty. The social scientists were convinced that affecting the students cognitively was not enough—they also believed it necessary to try and change students' values and self-identities, and "agreed that the formal structure and a narrow definition of roles would not suffice." For the natural scientists, changes beyond the cognitive were either irrelevant or undesirable.

The case of Hawthorn may not be representative, but it probably is true of many, if not all, institutions. (If the natural scientists at Hawthorn are typical of natural science faculties at other colleges, then this may help to explain the relatively poor showing of science students among Trent's and Medsker's exceptional changers.) It is interesting that the Hawthorn developments took place at an institution intentionally founded to overcome the vocationalism and impersonality characteristic of large universities. One could ask what might the pattern be if these characteristics were not of concern? Nevitt Sanford believes that students at most colleges are not usually told what the purpose of education is or urged to seek a purpose. Any appeal to students' motivation is likely to be through self-interest in a job, or in a pecuniary way, or through success and satisfaction entirely within a profession. "Seldom," Sanford declares, "are students told they should do something because they are going to be leaders of a society that expects important things of them." [131]

Even the "academic" student culture so strongly represented at the high-quality institutions is seen by David Riesman as only a higher vocationalism—a training ground for graduate and professional schools.[132] If there is a rat-race for high grades, and the demands of the curriculum are strong enough, there is little time to cultivate a humane style of life. James Coleman thinks that a true student community cannot be founded on such a basis.[133] Sussman feels that since neither the vocational nor the academic cultures are able to furnish the basis for a viable intellectual community, and if the collegiate fun culture is dying out (not likely for some time yet), then only the nonconformist, alienated students have the possible base for a profound communal experience in college by way of protest.[134]

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[130] Zelda F. Gamson, "Utilitarian and Normative Orientations Toward Education," in *Sociology of Education,* Winter 1966, pp. 46–73.

[131] Sanford, *Where Colleges Fail,* pp. 75–76.

[132] David Riesman, "How Effective Are American Colleges?" in *Academic Effectiveness,* the 1963 New England Board of Higher Education Workshop on Institutional Research, published in 1964 by the University of Massachusetts, edited by R. Castelpoggi.

Although the student protests beginning with the Berkeley Free Speech Movement (FSM) in 1964 are associated with politics, civil rights, and Vietnam, there has also been a continuous element of dissatisfaction with higher education on the part of student activists.

As Katz has pointed out, the Berkeley disturbances began over educational reforms, and it was not until subsequent administrative actions that more student resentment was aroused, and "the issue became focused on the relatively simple principle of political freedom, rather than on the more complex one of educational reform. . . ." Katz and his associates feel that since 1964 "larger numbers of students have become involved in educational issues, and that the activists have increasingly become representative of the broad mass of students." [135]

An examination of the major fields, personality, and intellectual orientation of student activists reveals some factors relevant to our purpose. Katz reports that Free Speech Movement students at Berkeley included humanities and natural science majors in about the same proportion as the rest of the student body; but that only 1.3 percent of these activist students were majoring in either business or engineering, whereas 17.8 percent of all students were. The social sciences majors had a greater representation in the FSM than in the students as a whole.[136] The table below compares scores on the OPI for representative samples of FSM students who were arrested, seniors at Berkeley, and the college persisters from *Beyond High School*. The FSM sample was considered to be representative of those arrested with the exception that sophomores were slightly overrepresented and graduate students underrepresented.

TABLE 10.—*Mean standard omnibus personality inventory scores obtained by University of California seniors, members of the free speech movement, and a national sample of college persisters*

Scale	National (1963) persisters (N=1385)	Berkeley (1965) seniors (N=92)	FSM arrested (N=130)
Thinking introversion	52	55	63
Complexity	51	54	66
Estheticism	51	52	61
Autonomy	53	61	67
Impulse expression	51	54	64
Religious liberalism	48	58	64
Lack of anxiety	52	51	48

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[133] See Sussman, below, and Coleman's chapter in *College Peer Groups*.

[134] Leila Sussman, review of *College Peer Groups*, edited by Newcomb and Wilson, in the *American Sociological Review*, August 1967 pp. 659–660.

[135] See Joseph Katz, "The Activist Revolution of 1964," in Katz, *et al*, *No Time For Youth*, pp. 386–414.

[136] Katz, "Activist Revolution," p. 397.

For all scales of the OPI the normative freshman mean is 50, and the standard deviation is 10.[137] As Trent and Craise point out, "few college students in general can match the positive development of those personality characteristics that distinguish student activists from their college contemporaries." On all scales except anxiety, the FSM students exceeded the Berkeley seniors' scores by at least six points. The authors feel that the lower scores on the anxiety scale may have been due to the stress caused within the FSM at that time or it may exhibit "a price paid" for greater social and intellectual commitment than their fellow students. But their unusually high scores on the intellectual disposition and autonomy scales show a strong educational involvement as well as political commitment.

Trent and Craise believe that student activism is associated with curriculum, type of college attended, and a level of intellectual disposition and autonomy that is uniquely high.

As the authors state, activists are more likely to occur at a few high quality liberal arts colleges and universities. Since the student activists come almost entirely from among liberal arts majors, Trent and Craise have included a table that shows level of intellectual disposition by broad curriculum. This data is from *Beyond High School*, and was developed through use of the OPI, but was not presented in that publication in quite the same way.

TABLE 11.—*Percentage of students in the national sample in various curricula at each level of intellectual disposition*

	Major		
Level of intellectual disposition	Liberal arts (N=1096)	Education (N=572)	Technology and business (N=899)
High	28	11	7
Middle	37	34	25
Low	35	55	68
Total	100	100	100

$X^2=273.96$; $p<.001$.

This table speaks for itself, but the authors feel compelled to point out that from this table and related data "a question must even be raised about the dedication of education majors to teaching. Almost all the education majors were more interested in the security of steady employment than in the use of their talents, and almost half of the education majors preferred homemaking or some other occupation to a career in teaching." [138]

Richard Flacks, in an examination of the main value themes which characterize the student movement, has found one of the central themes to be "the expression of a desire for a campus 'community,' for the breaking down of aspects of impersonality on the campus, for more direct contact between students and faculty. There is a frequent counterposing of bureaucratic norms to communal norms; a testing of the former against the latter."[139] Flacks' results shows that activist students are superior students, coming from high-income professional families with "education-nurturing" parents (my term), and who are highly intellectually oriented. Trent and Craise also point out that most students at Berkeley, and nationally, are content with their education, "but that a small, crucial minority are seriously critical." Also, as already noted, that minority of critical students seems to be growing. "Perhaps the most overt expression," say Trent and Craise, "of this disenchantment is directed against the new professionalism—a sign of the growing discontent of some of today's more able and valuable students with the trend of higher education in the United States."[140] Riesman calls this growth of professionalism in academia a "higher vocationalism."[141]

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[137] The source of this table is: "Commitment and Conformity in the American College," by James W. Trent and Judith L. Craise, in "Stirrings Out of Apathy: Student Activism and the Decade of Protest," in *The Journal of Social Issues*, whole of issue number 3, July 1967, pp. 34–51.

[138] Trent and Craise, "Commitment and Conformity," p. 42.

The years immediately after World War II and the 1950's were, as Nevitt Sanford puts it, "great times for research and graduate training," but times have changed, and Sanford sees the student protest movements as being, "fundamentally, a reflection of changed times, and they are a warning that the colleges and universities must change."[142]

Everett C. Hughes depicts the history of American education as being a dialectical process between restriction and universality; he sums up his view of American higher education with a remark worth quoting in full:

> The people who established our peculiar educational institutions were usually seeking progress along a particular line—toward Heaven, better crops, better schools, and what not. Progress, if persisted in along a particular line for too long, may become regression and some measure of return to something more general may be called for. The latest particularism in American education is that of training people for particular occupations or specialties. The next fight for freedom in education may be that for freedom to choose one's prerequisites and to change one's mind about his career later than his freshman year.[143]

In 1959 those were prophetic words.

There seems to be increasing recognition that "something" is wrong with much of American higher education, and that "something" will have to be done about it. Jencks and Riesman, in their recent book, report a conversation they had with the "thoughtful president of a great university" who felt that "all the fine venturesome colleges in America"—the Reeds, Haverfords, etc. "amounted to nothing because they affected such a tiny handful of students." The real question, he believed, "was whether the big universities followed the California model, which ignored the undergraduates, or the Michigan model, which tried in a modest way to do something sensible and sensitive for them." Jencks and Riesman ask why Michigan differs from California, and their answer is that there are enough faculty members and administrators at Michigan who have taught in or attended those "fine, venturesome colleges," so that the memory of those colleges "provides a continuing incentive not to abandon the undergraduates to each other." They feel that such faculty members are less common at California.[144]

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[139] Richard Flacks, "The Liberated Generation: An Exploration of the Roots of Student Protest" in *The Journal of Social Issues,* July 1967, pp. 52–75.

[140] Trent and Craise, "Commitment and Conformity," p. 46. This appears to be true not only in the U.S.: students at Essex University in England "protest that what they want from a university is not training but education. . . ." Donald Davie, "Lost Gratifications," in *Encounter,* September 1968, p. 56.

[141] The theme of the growth of professionalism is developed at length in *The Academic Revolution* by Christopher Jencks and David Riesman, New York, 1968. See also Laurence R. Veysey, *The Emergence of the American University,* Chicago, 1965, and *The Dissenting Academy,* edited by Theodore Roszak, New York, 1968.

[142] Sanford, *Where Colleges Fail,* p. 104.

[143] Everett C. Hughes, "The Academic Mind: Two Views," in the *American Sociological Review,* vol. 24, 1959, pp. 570–576.

Even if Jencks' and Riesman's explanation is not numerically correct, Michigan is putting such faculty members in positions of strategic importance for undergraduate education. The "Pilot Program" at the University of Michigan is serving as a literal test for the opening of a new, small residential and experimental liberal arts college within the university. The program is also fostering "Pilot Houses" within the existing university residence halls which are bringing some intellectual life into the halls themselves and trying to break up the anonymity and alienation which inhibit the educational objectives of a large university.[145] Must of the credit for the inception and administration of these programs belongs to Theodore Newcomb, who taught at Bennington in the 1930's, and who has, of course, written two books about that college.

Although the University of California at Berkeley has, since 1957, a regulation permitting experimental liberal arts curricula outside the regular curriculum of the College of Letters and Science, this provision was invoked only once in eight years to allow the introduction in 1965 of the "Experimental College Program," a two-year innovative curriculum in a non-residential college for 150 freshmen.[146] Professor Joseph Tussman, of the philosophy department, the originator of this experiment, had been trying for several years to obtain permission and resources for his experimental project. It is not coincidental that Tussman received permission and resources when he did, and it is probably not coincidental that Tussman taught at Wesleyan before moving to Berkeley.

Sanford has criticized the "Muscatine Report ' for not going far enough: it flirts with the developmental point of view but doesn't really take it to heart; the authors (of the report) are not really convinced that learning is a highly personal thing. But Sanford says it is understandable why the report does not go far enough: "it would be easier to design a new institution on the basis of what we now know about education than to modify an enormous and complicated structure such as the University of California at Berkeley. The recommendations in Muscatine were made on shrewd judgments of what the traffic will bear and not the ideal." [147] A change of attitude on the part of the people who run colleges is essential if we are to reform them, Sanford believes. "The faculty must take some interest in general education and begin to conceive of themselves as educators." More faculty are going to have to take an interest in students, to know them, and willing to do something for them, or not much will happen.[148]

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[144] Jencks and Riesman, *Academic Revolution*, pp. 503–504.

[145] Donald R. Brown, "Student Stress and the Institutional Environment," in *The Journal of Social Issues*, July 1967, pp. 92–107.

[146] See *Education at Berkeley* (the "Muscatine Report"), Report of the Select Committee on Education, Berkeley, 1966, pp. 110–111, 132. The report notes that this was the only time such a program was allowed, and, "at present, no successors are apparent."

[147] Sanford, *Where Colleges Fail*, p. 98.

As a means of reducing the impersonality and alienation characteristic of the large university, Parsons and Platt say their observations for their study of college faculty indicate that there is likely to be a commitment to "affective" ties as a means of integrating faculty and students at highly differentiated institutions.[149] These authors hypothesize that an affective teaching style will become normative for the entire academic system. They also suggest that where there is institutional structural strain, there will be a departure from this norm and there will exist at these institutions a greater incidence of cognitive and mixed (cognitive and affective) teaching styles. They expect that medium differentiated institutions, especially those undergoing rapid and conscious upgrading, will suffer integrative strains in various structural dimensions, including the teacher-student relationship, and will show the lowest commitment to affective teaching, as did the medium differentiated schools in their pilot study.[150] The low differentiated schools showed the most commitment to affective teaching (in their attitude toward students) with the high institutions falling in between the low and medium schools. As the low differentiated schools, however, because of wide use of part-time faculty, heavy teaching loads, and high faculty-student ratios, they actually have less nonclass contact with students than the high institutions. Contact with students beyond classes *exceeds* the faculty-student ratio at the high colleges, but is much *lower* than the faculty-student ratio at the low schools. The medium schools show a mixed pattern. The authors believe, therefore, that implementing an affective teaching standard will be easiest at those high schools where the student-faculty ratio is lowest.

Parsons and Platt feel that there is a general desire now for a fusion between teaching and research, and that there is, at present at least, a resistance to excessive specialization in either of these activities. In other words, the low schools, which now show practically no research or other scholarly activity, will have to become more intellectually alive, and the high and the medium differentiated colleges will have to become more conscious of students and their needs.

In addition to faculty concern for students, the students themselves seem to respond best to college instructors who are fundamentally involved with their discipline. In his study of highly talented college students, Thistlethwaite requested them to evaluate the three college professors who they thought had contributed most to their desire to learn. Thistlethwaite observed that the students overwhelmingly elected instructors who had shown great enthusiasm for their disciplines. Most of these students also said that these same instructors had also shown an interest in them as well as in their work.[151]

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[148] Sanford, p. 97.

[149] Talcott Parsons and Gerald M. Platt, *The American Academic Profession, a Pilot Study,* unpublished paper, 1968, ch. VI, p. 30. The authors define affective as valuing personal relationships with students by faculty, and cognitive as those faculty who insist that students can learn from an impersonal teacher.

[150] The authors' Scale of Institutional Differentiation is based on size, quality, and research activity. Highly differentiated institutions are large, high quality, and show much research activity; low differentiated institutions are small, of low quality, and exhibit little or no research. The definition of quality is a general affluence based on the usual indicators: income per student, books per student, scholarship funds per student; teacher-student ratio, etc.

A college teacher's enthusiasm for his discipline can be infectious to students and help them to become excited about learning, but if it goes too far it can result in a vocationalism and professionalism that obscures the true educational process and becomes training rather than education. Premature specialization can harm the developing individual, as Sanford points out, and the discipline in which he works as well. Sanford feels that in the study of human life and society, premature specialization and "precosity in the use of concepts and methods may easily serve as a substitute for experience and even as a defense against it, thus blocking creativity at its source." He sees this happening in his own discipline of psychology: "Where, due to the continuing 'upgrading' of the undergraduate curriculum, an increasing number of entering graduate students arrive with a good grasp of certain methods and a conception of themselves as scientists but with little background for judging what the problems are. They are then so taken up with empirical busywork that they have little chance to acquire introspective knowledge or vital acquaintance with the field." He fears the result of this may be a narrow, mechanistic psychology. It is particularly sad to see the same thing happening in the humanities, which Sanford feels have also become dominated by a conceptual and methodological orientation.

Undergraduates tend to define themselves through their disciplines, once they have decided upon a career, and, as Sanford is quick to point out, this can be important developmentally by furnishing a needed sense of identity. But it tends to confuse education with training, with an identity based on doing more than being. Too many college teachers of undergraduates want to recruit "students into their discipline as early as possible" and professionalize "them thoroughly—a process that tends to warp education and should thus be postponed until graduate school."

If education is to bring forth and develop the potential of the whole person, to make him flexible, independent of thought, and mature in his social responsibility, then these characteristics have to be developed. They do not usually exist at birth or in freshmen, but they can be developed. If we agree that a central purpose of undergraduate education is the fullest possible development of the whole personality, then it is a purpose, Sanford declares, that ought to be served by every aspect of the college environment. Every aspect—curriculum, teaching methods, organization of student-teacher relationships, living arrangements, extra-curricular activities, the activities of the president and his administrators—all should be directed to the purpose of contributing to individual development.[152]

More often than not, higher educational institutions are not organized so that every aspect of the environment is directed at the central purpose of developmental change in students. Katz, commenting upon the partial change noted in the Berkeley and Stanford students he studied, believes it may well be that the organization of higher educational institutions "is not sufficiently supportive of beneficial characterological alteration."[153]

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[151] Donald L. Thistlethwaite, "College Press and Changes in Study Plans of Talented Students," *Journal of Educational Psychology*, August 1960, pp. 222–234.
[152] Sanford, *Where Colleges Fail*, pp. 89, 92–93, 157.

Bruno Bettelheim has shown us the most effective way to personality change—whether beneficial or perverted; and, even though he is a psychoanalyst, he believes that: "Being placed in a particular type of environment can produce much more radical changes, and in a much shorter time." Bettelheim has adapted psychoanalytic theory, and his experience in a Nazi concentration camp, into a form of milieu therapy, "a purposefully designed total environment, apt to help in achieving radical personality changes in persons who could not be reached by psychoanalysis." Bettelheim has achieved strikingly beneficial results with profoundly disturbed autistic children, at the University of Chicago Orthogenic School, who had been given up as incurable by everyone else.[154]

We should not want to turn colleges and universities into concentration camps, nor should we want to manipulate every minute nor every aspect of an undergraduate's life—the students would not and should not stand for that any way, but the direction and purpose are clear: the undergraduate college should be organized to reinforce its purpose and not to distract from it. This is, no doubt, why the small high quality liberal arts college is so relatively effective: the central purpose of the institution, the education of undergraduates, does not get lost amid the side-shows or made into a poor relation by the graduate and professional schools of the large university—which can so easily run off with the whole show.

Sanford points out that the "explosion in knowledge" carries no great meaning for educators: "Since we can never teach more than fragments of all the knowledge there is, we should make our choices on the basis of what we believe the student needs in order to change him as a person." Even "the 'Muscatine Report' admits that quite different contents will do." "It is not how much students are offered in the way of courses and syllabi that matters; it is the experiences they have."[155]

CONCLUSION

We have come a long way from the early efforts to rank colleges through "productivity" studies. Much of what has been done since only documents the observations of perceptive practitioners of higher education or adumbrates the obvious. Some of the research deepens insights, or provides new insights, and we may yet find a valid means of measuring the impact of college on students and a means of determining the differential effects of colleges on students. A completely convincing, quantitative way to determine within college effects has yet to be developed—let alone a means of evaluating between college effects. Until we have such a method it would be foolhardy to dismiss the possibility that colleges change their students, and that some colleges change more students, and to a greater degree, than other colleges. The negative, pessimistic findings of some of the statistical, empirical studies of college impact described in this paper can be seen as nothing much happens to college students, or that, in the end, we still have to rely on value judgments and the observations of those involved.

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[153] Katz, "Four Years of Growth," p. 7.

[154] See Bruno Bettelheim, *The Informed Heart, Autonomy in a Mass Age,* Glencoe, Ill., 1960. Bettelheim's most extensive description of his work with autistic children at the Chicago Orthogenic School is *The Empty Fortress, Infantile Autism and the Birth of the Self,* New York, 1967.

[155] Sanford, *Where Colleges Fail,* pp. 98–99.

We can conclude that the possibilities for significant developmental change in college depend on a state of readiness in the student. An intellectual predisposition (as well as ability) is necessary, but the psychological state of readiness that can be traced back to early environmental influence—particularly the family—is also necessary.

Although the predisposition for change in the student is critical, after that it is the nature of the college environment the student enters which will determine how much he will grow and change. The kinds of responses desired in college cannot be made unless the student is ready. The condition of readiness is needed for further development, but it is not itself a sufficient cause of such development—this is where the nature of the college he enters becomes of great importance.

It is true that the distinctive character of colleges with strong intellectual climates is partly dependent on student quality, but it is also dependent on institutional processes and characteristics that are independent of the students who attend those colleges. Lack of ability or lack of an intellectual predisposition in students are not the only characteristics that give a college a weak intellectual climate, and it is not student ability and intellectuality alone that give a college a pervasive intellectual climate. The nature of the faculty and administration, their policies and practices, are just as important.

When students with the necessary psychological readiness for change are combined with institutional characteristics and processes that are organized to stimulate developmental change and growth in students, rather than distract from it, then a "critical mass" can occur which provides a strong intellectual climate and a potential environmental impact on students. When there is a "conjunctivity" between students who are ready and the environmental "press" of the college, then the students will have an "experience," as well as acquiring cognitive content and intellectual skills, so that they will change and grow. At ineffective colleges the students only acquire the content without the experience. Effectiveness in a college, then, is the product of the conjunction of student ability, readiness, and expectations with the opportunities, demands, and stimulation of the college environment: student subcultures, and faculty and administrative characteristics, policies, expectations, and practices.

Short-Run Cost Variations in Institutions of Higher Learning

Hans H. Jenny and *G. Richard Wynn**

I. INTRODUCTION

This paper will report on cost variations for a group of 31 small, private, four-year liberal arts colleges between the school years of 1959–60 and 1967–68. The data are confined to the institutions' *current* or *operating* accounts. The basic sources were the detailed income and expenditure audits and supplemental reports provided by each college. Capital expenditures are not included in this study unless they appear in the operating data. For purposes of reasonable comparability certain adjustments had to be made in the figures obtained from some of the institutions. The most important of these are explained in the appendix to our paper, "The Expenditure Outlook for Private Colleges," which also appears in this collection.

In 1968, the individual colleges in this study ranged in enrollment from 488 to 2,711. Only four of the 31 colleges were established in this century; 20 were in existence at the time of the Civil War, and three began operations prior to 1800. Tuition and fees varied from a low of $1,000 to a high of $2,256, and the typical comprehensive charges per student amounted to a minimum of $2,091 and climbed as high as $3,306. If we express the total annual operating expenditures on a *full time equivalent student* basis (FTES),[1] we obtain a range of $2,750 to $5,916.

In the tables, charts, and comments which follow the primary emphasis is on selected highlights from an as yet incomplete study[2] of the nature, structure, growth, and inter-connectedness of key college income and expenditure components. The bulk of the figures presented here represent FTES income and expense information. In this manner,

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[1] College enrollment figures normally include part time, night, special, and other students; individual schools will vary substantially in their method of reporting such students. Therefore, we asked the Registrar's Office of each school in the sample to provide us with data on (a) full time students, (b) part time and special students, (c) how many full time students (b) represented. On this basis we arrived at an estimated Full Time Equivalent Student figure for all schools.

[2] We emphasize the interim nature of this report. The deadline under which we operated did not allow us time to verify certain data. Although we attempted to minimize errors, some certainly exist. This is particularly true of the full-time equivalent student data; we have discovered and are rectifying inconsistencies in the data provided us by the individual schools. Our final report thus should benefit from the refining of our data. For the present, we are somewhat more confident of the trends revealed than of the accuracy of some of the individual data.

we believe, comparability has been enhanced. We are also using the more conventional aggregate data, but we shall explain in Sections II/3 and III/3 why we prefer the FTES approach.

Before proceeding with this discussion, a few warnings would seem to be in order. First, by themselves the figures which follow do not tell us much about the *quality* of the individual educational institution. We may be able to tell whether there have been shifts in relative financial positions, and we may detect certain changes in priorities, provided we are content with broad and superficial generalizations. Of course, the informed reader can make certain inferences about quality, but if he is a cautious analyst he will want to know more.

Although we have supplied a list of the names of the colleges used in the sample, our tables and other summaries identify individual institutions merely by means of a letter. This may contribute at least marginally to some degree of objectivity on the part of the reader; unfortunately we may have added at the same time to confusion if the reader should indulge in too much guessing as to which figures should match which name on our list. Most of the data to be presented were obtained on the promise of anonymity.

Second, the colleges in our sample disclose some patterns of remarkable homogeneity. Nevertheless, they conduct their educational and administrative tasks in many different individualized ways. Eventually, we need to know more about the *comparative micro-structure*[3] of the institutions in the sample, of their costs for individual academic disciplines, for plant maintenance, and for the many specific administrative functions. As this study progresses along with others now under way, we expect to gain such detailed insight and from it may be able to determine some of the specific reasons for the often very wide cost differentials.

Third, it is essential that we learn how to distinguish between cost escalation which has to do with inflation and that which stems from improvements in the quality of the educational service. Today, and certainly from the figures which will follow, it is impossible to say how much of the overall cost increase pertains to the former and how much of it is connected with the latter. *We suspect that quality improvement is responsible for a substantial share of the increase overall rather than the prevailing inflationary pressures.* But we shall not try to prove this point in this paper.

In measuring the degree of inflation one normally assumes that quality improvement in the product in question has been properly accounted for. Price movements are traced over time for *stable quality specifications.* For prices of services, particularly medical and educational ones, this represents great difficulties.

Among the substantial cost increases our study reveals no surprises when it points to Instructional Expenditures as one of the chief reasons for higher tuitions and higher FTES costs in general. Faculty Salaries have represented between 74% and 80% of the Instructional cost. Now, if a college increases the salary of one of its teachers this might be likened to an inflationary cost increase. If the teacher's classes grow one might say that productivity has improved (although the quality of his teaching service might decline), and the aggregate cost increase need not result in higher FTES costs. Even if his higher salary is matched by a decrease in his teaching load, leaving him time for a specified research activity which did not take place before, the higher cost per student will not fall within a strictly inflationary cost increase category.

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[3] By micro-structure, we are referring to such things as costs per credit hour, comparative costs of academic courses, comparative costs of specific administrative functions, etc.

Furthermore, salary cost escalation which has been very sharp and is expected to continue at a high rate turns out to be an important factor in the *quality competition* which is prevalent in higher education today. Very often it is the higher salary which has been used to upgrade the quality of languishing academic departments, to add a name of renown to the roster of faculty members, and to upgrade the reputation of the institution in general.

Similarly, the increases in aggregate and per student costs in Administration reflect not so much the higher prices for a static set of services, but the addition of new ones without which the modern college (especially the residential ones) cannot do. Much has been said and written about the backward art of college and university management. Often improved management has brought with it higher administrative costs.

Another element in the quality of education is the plant and equipment explosion which has taken place in recent years. Much of this will continue. During the period studied, nearly every college in the sample has experienced substantial additions to classroom, auxiliary enterprise, and equipment (computer) facilities. Most of the new plant is air-conditioned, except perhaps in the northernmost States. This sharply increases annual operating costs. Yet, the effect of higher plant and equipment expenses on the FTES cost has been relatively small compared to other expense components!

Finally, one of the most striking sources of cost escalation for the schools in our sample has been the need to subsidize[4] students. Student Aid expenditures have become—as we shall show—one major reason for the college's high tuition charges and for their deficits. In the competition for qualified students, private colleges are pricing themselves out of their former markets. Escalating Student Aid expenditures lead to higher tuition charges and these in turn necessitate larger subsidies. If private colleges did not have to pay such high subsidies, future tuition increases could become much more moderate on average. The figures which we shall present later tempt one to foresee tuition reductions in some instances given the ideal case where a given college would limit its Student Aid subsidies to the income specifically available for such a purpose, the remaining costs being taken over by society. As of now, except for the few far-seeing states which have enacted appropriate legislation, the danger is high indeed that the Student Aid grants required to assure the necessary enrollments will not only bring about massive recurring operating deficits, but at the same time retard the qualitative academic development of the institution for lack of funds.

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[4] We define "subsidy" as the difference between total student aid expense (or FTES student aid expense) and gift and endowment income specifically reserved for student aid. This is depicted in graphs 2.A and 2.B.

If the following figures do not tell us all we should like to know, we trust that they represent a useful first step in the comparative analysis of short-run cost variations for a group of similar institutions of higher learning. Our sample may be representative of only one segment of private higher education; at least we believe that it does speak with some authority for this segment.[5]

II. SUMMARY OF MAJOR FINDINGS

We should like to remind the reader once more that this study represents a progress report. This summary and the section which follows it will concentrate on those preliminary findings which we believe to be sufficiently stable that later additions of schools to our sample will not require massive amendments. And since the deadline presented us with a major constraint, we were forced to be quite selective in the material which should be included here. Therefore, anything which required extensive computer or statistical manipulation must be left to a later report.

This summary will touch on the following major aspects of our study: (1) a comparison of enrollment growth rates with the rate of cost escalation; (2) a comparison of the rate of growth of major income and expense components; (3) an evaluation of some key changes in the structure of major income and expense elements.

1. Enrollment Growth and Cost Escalation

The growth of college operating expenditures is a function of several elements: increases in tuition and other charges, endowment and gift income growth, personnel and salary policy, all manner of changes in program, and increases in enrollment. When we single out the latter in what follows, we do not wish to establish any specific cause-and-effect relationships. We merely wish to point out how the growth rates of three known variables have behaved over a time span of nine years, namely the period from 1959–60 through 1967–68.

The first important general finding is that aggregate Educational and General expenditures increase faster than the corresponding FTES costs. Second, the rate of increase is on balance greater when enrollments increase more rapidly, and it is slower when the latter move up more slowly.

This characteristic relationship is depicted first in Figure 1.A for two hypothetical cases. Case A assumes an enrollment growth which is above average for the sample. The slope for aggregate Educational and General expenditures is much steeper than for the corresponding FTES costs. On the other hand, in Case B enrollment growth is assumed to be very small and the slopes of the two expense indicators diverge less dramatically. In Case A aggregate spending is depicted as rising 2.3 times as fast as FTES cost, whereas in Case B the aggregate growth is shown to exceed FTES cost growth by a factor of only 1.48.

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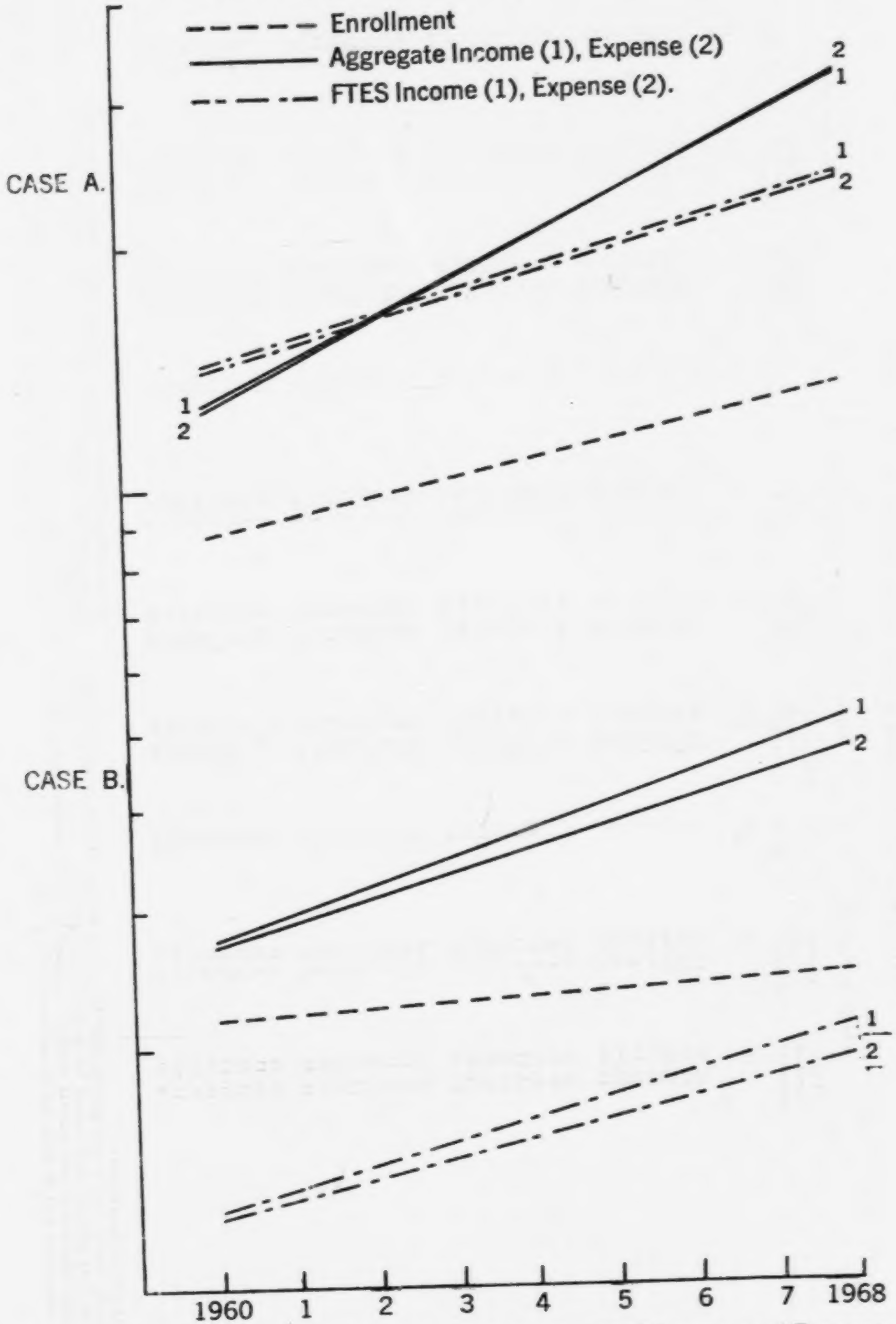
[5] For a discussion of the nature of the sample, see our paper, "The Expenditure Outlook for Private Colleges," which also appears in this collection.

Figure 1.A.

Educational and General Expenditure Growth.[a]



[a] The axis plots dollars in thousands for the FTES Income and Expense.

TABLE 1.A.—*Comparison of Enrollment Growth and Cost Escalation* [1]

School [2]	Enrollment growth			Educational and general expense growth				Total expense growth			
	Total, 1960–68 (percent) (1)	Annual mean (percent) (2)	Rank (3)	Aggregate, 1960–68 (percent) (4)	FTES, 1960–68 (percent) (5)	Ratio (4) ÷ (5) (6)	Rank (7)	Aggregate, 1960–68 (percent) (8)	FTES, 1960–68 (percent) (9)	Ratio (8) ÷ (9) (10)	Rank (11)
A	97. 15	12. 14	1	197. 25	50. 77	3. 89	1	205. 20	54. 61	3. 76	2
B	87. 55	10. 94	2	176. 67	45. 82	3. 86	2	172. 09	43. 29	3. 98	1
C	85. 03	10. 63	3	169. 20	45. 46	3. 72	3	227. 11	76. 75	2. 96	4
D	55. 21	6. 90	4	120. 94	42. 32	2. 86	4	117. 92	40. 38	2. 92	5
E	52. 16	6. 52	5	153. 65	66. 71	2. 30	6	153. 89	66. 88	3. 20	3
F (7)	33. 09	5. 65	6	77. 73	33. 53	2. 32	5	76. 88	32. 89	2. 34	6
G	43. 68	5. 46	7	125. 92	57. 22	2. 20	7	118. 68	52. 18	2. 27	7
H (5)	21. 39	5. 35	8	70. 98	40. 90	1. 74	13	86. 15	48. 22	1. 79	12
I	39. 70	4. 96	9	141. 50	72. 79	1. 94	9	109. 21	49. 73	2. 20	8
J (8)	31. 37	4. 48	10	100. 46	52. 58	1. 91	10	90. 88	45. 30	2. 01	10
K (8)	31. 01	4. 43	11	135. 55	79. 84	1. 70	16	118. 28	66. 65	1. 77	14
L	34. 33	4. 29	12	105. 84	53. 19	1. 99	8	101. 08	49. 70	2. 03	9
M	32. 56	4. 07	13	129. 59	73. 14	1. 77	12	126. 79	71. 10	1. 78	13
N	31. 38	3. 92	14	106. 08	56. 84	1. 87	11	96. 10	49. 25	1. 95	11
O (5)	15. 26	3. 82	15	50. 77	30. 80	1. 65	19	51. 48	31. 44	1. 64	18
P	29. 25	3. 66	16	125. 17	74. 29	1. 68	17	127. 12	75. 83	1. 68	16
Q	27. 10	3. 39	17	161. 46	105. 66	1. 53	20	164. 07	107. 74	1. 52	27
R	26. 45	3. 31	18	99. 12	57. 50	1. 72	14	111. 70	67. 45	1. 66	14
S	25. 27	3. 16	19	156. 56	104. 72	1. 50	23	140. 38	91. 95	1. 53	23
T	24. 93	3. 12	20	92. 15	53. 83	1. 71	15	86. 10	48. 96	1. 76	15
U	22. 05	2. 76	21	82. 32	49. 43	1. 67	18	92. 20	58. 34	1. 60	19
V	21. 34	2. 67	22	106. 65	70. 30	1. 52	21	92. 34	58. 49	1. 58	20
W (7)	14. 44	2. 41	23	69. 71	47. 20	1. 48	24	58. 19	37. 55	1. 55	21
X	19. 24	2. 41	23	94. 53	63. 15	1. 50	23	85. 03	55. 21	1. 54	22
Y	19. 11	2. 39	24	91. 61	60. 85	1. 51	22	82. 11	52. 90	1. 55	21
Z (7)	14. 21	2. 37	25	114. 29	87. 78	1. 30	28	98. 11	73. 76	1. 33	27
AA	17. 49	2. 19	26	196. 63	152. 48	1. 29	29	176. 29	135. 16	1. 30	29
BB	16. 59	2. 07	27	115. 26	84. 74	1. 36	26	91. 92	64. 62	1. 42	26
CC	16. 08	2. 01	28	92. 92	66. 19	1. 40	25	84. 98	59. 35	1. 43	25
DD	11. 82	1. 48	29	75. 19	56. 73	1. 33	27	77. 25	58. 52	1. 32	28
EE (7)	8. 69	1. 45	30	58. 08	45. 43	1. 28	30	74. 47	60. 51	1. 23	30

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[1] This table reads as follows:

College A (line 1) had a total growth of 97.15 percent during 1960–68, a mean annual growth of 12.14 percent, and ranked 1st in enrollment growth.

Aggregate educational and general expense increased by 197.25 percent compared to FTES educational and general, which increased 50.77 percent.

197.25 divided by 50.77 equals 3.89 and gives college A 1st rank.

Aggregate total expenses rose 205.20 percent compared toFTES total expense growth of 54.61 percent.

205.20 divided by 54.61 equals 3.76 and gives college A 2d rank.

[2] Numbers in parentheses indicate years where data is not available for entire period.

Table 1.A. summarizes the comparison between enrollment growth and cost escalation. First, the table ranks the 31 colleges according to mean annual percentage enrollment growth.[6] The ranking is grouped into four quartiles. Second, we calculated a ratio by dividing the total growth of FTES costs into the total growth of aggregate expenditures. Third, we then ranked the resulting ratio or multiple. These calculations were made both for the Educational and General expense account and for Total Expense.

Table 1.A. discloses a very high correlation[7] between the aggregate-to-FTES cost multiple on the one hand and the enrollment growth ranking on the other. In the top quartile, the fit is almost perfect; it is slightly less good in the lowest quartile, and still less so in the two middle quartiles. Furthermore, the correlation is slightly better for the Educational and General expenditures than for Total Expense.

Table 1.B. expresses the same phenomenon in perhaps a more dramatic manner. We have asked the following question: *How much will annual FTES cost increase if we increase aggregate spending by $1.00?* Returning to our two illustrations from Figure 1.A., we obtain the answer $0.434 in Case A and $0.754 in Case B. If we compare the data of the two tables, we note that as long as the enrollment increases more than 4.29 percent per year on average every increase of $1.00 in total spending raises FTES costs by less than 60 cents.

These figures are particularly interesting because they relate to the problem of full utilization of physical capacity in institutions of

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[6] All growth rates used in this study are based on the assumption of linear growth; 1960 is used as the base year, and 1968 becomes our indicator of growth.

$$\frac{\text{1968 data}}{\text{1960 data}} = \text{Total \% Growth}$$

$$\frac{\text{Total \% Growth}}{N - 1} = \text{Annual Mean \% Growth}$$

where N = the years included in the study

It may be argued that other methods of calculating growth rates can be used. Consideration of other methods and their weaknesses, however, led us to select this approach for our interim report. These other techniques will be utilized as we progress further into our research.

[7] The application of Spearman's rank correlation to these data yields these results:

Enrollment growth rank and aggregate E & G cost to FTES cost ratio rank:

$$r = .9559$$
$$r^2 = .9138$$

Enrollment growth rank and aggregate total cost to FTES cost ratio rank:

$$r = .9547$$
$$r^2 = .9115$$

higher learning. Some possible dimensions of this will be taken up in Section III below. For the time being we should like to let the evidence speak for itself without any interpretations.

TABLE 1.B.—*Annual increase in FTES costs per $1 increase in aggregate costs* [1]

School	Annual percentage enrollment growth	Rank	Educational and general expenses (cents)	Rank	Total expenses (cents)	Rank
A	12.1	1	25.7	1	26.6	2
B	10.9	2	25.9	2	25.2	1
C	10.6	3	26.9	3	33.8	3
D	6.9	4	35.0	4	34.2	4
E	6.5	5	43.4	6	43.5	6
F	5.7 (7)	6	43.1	5	42.8	5
G	5.5	7	45.4	7	44.0	7
H	5.4 (5)	8	57.6	13	56.0	12
I	5.0	9	51.4	9	45.5	8
J	4.5 (8)	10	52.4	10	49.8	10
K	4.4 (8)	11	58.9	16	56.3	14
L	4.3	12	50.3	8	49.2	9
M	4.1	13	56.4	12	56.1	13
N	3.9	14	53.6	11	51.2	11
O	3.8 (5)	15	60.7	19	61.1	18
P	3.7	16	59.4	17	59.7	16
Q	3.4	17	65.5	20	65.7	25
R	3.3	18	58.0	14	60.4	17
S	3.2	19	66.9	24	65.5	24
T	3.1	20	58.4	15	56.9	15
U	2.8	21	60.0	18	63.3	19
V	2.7	22	65.9	21	63.4	20
W	2.4 (7)	23	67.7	25	64.5	22
X	2.4	24	66.8	23	64.9	23
Y	2.4	25	66.4	22	64.4	21
Z	2.4 (7)	26	76.8	29	75.2	28
AA	2.2	27	77.5	30	76.7	30
BB	2.1	28	73.5	27	70.3	27
CC	2.0	29	71.2	26	69.8	26
DD	1.5	30	75.4	28	75.8	29
EE	1.5 (7)	31	78.2	31	81.3	31

[1] Table No. 1.B. reads as follows (line 1): College A had a mean annual enrollment growth of 12.1 percent; ranked 1st in enrollment growth; for $1 increase in aggregate educational and general expense, FTES educational and general expense rose by 25.7 cents and FTES total expense rose by 26.6 cents.

Note: Numbers in parentheses indicate years where data is not available for entire period.

2. Growth of Major Income and Expense Components

If we organize the 31 colleges—as will be done throughout this report—into quartiles according to their mean annual enrollment growth, we obtain the following *FTES mean annual income and expenditure percentage growth summary:*

[In percent]

	1st quartile	2d quartile	3d quartile	4th quartile	31 colleges
Expenditures:					
Student aid	9.26	15.43	13.44	14.59	13.37
Library	10.90	14.63	13.61	11.68	12.49
Instruction	7.32	10.69	7.90	10.76	9.15
Administration	7.16	10.55	9.25	13.24	10.17
Auxiliaries	7.78	5.18	6.55	5.90	6.46
Operation and maintenance	2.97	8.44	6.96	7.41	6.48
Total E & G expenditures	6.58	10.45	8.35	10.80	9.69
Total expenditures	7.09	8.96	8.12	9.73	9.20
Income:					
Gifts for operations	4.51	13.07	11.54	13.88	11.11
Tuition and fees	9.16	9.39	10.03	9.60	9.69
Auxiliaries	6.31	5.39	5.55	4.73	5.70
Endowment	−2.13	16.04	2.98	13.49	6.15
Total E & G income	6.81	10.67	8.55	11.44	9.45
Total income	6.79	8.76	7.75	9.77	8.41

On balance, the colleges with rapid enrollment growth have experienced less FTES percentage expenditure growth than those with less rapid increases in enrollment. In the same manner, FTES percentage income growth tends to be less in the first two quartiles and somewhat larger in the last two. But there are numerous exceptions to this, particularly when we begin to look at the growth rates, college by college.

Tables 2.A. and 2.B. provide the detail on which the above summary is based. We have added *rank* identifications with each major income and expenditure component.

In interpreting the two summaries, it is important to remember that we do not attach the same value to each type of income and expenditure. For instance, when we see high FTES spending for Instruction and Library (provided the latter means books rather than personnel cost) we tend to approve. In contrast we should prefer FTES cost of Administration not to increase too rapidly.

TABLE 2A.—*Mean annual percentage growth summary per full-time equivalent students—major income components* [1]

School	Enrollment growth (percent)	Rank	Tuition and fees (percent)	Rank	Endowment income (percent)	Rank	Gift income (percent)	Rank	Total E+G income (percent)	Rank	Auxiliaries income (percent)	Rank	Total income (percent)	Rank
A	12.1	1	7.10	26	0.49	23	9.60	15	7.44	19	6.03	12	6.57	22
B	10.9	2	7.91	22	−3.27	29	32.34	2	3.83	30	4.75	16	3.96	30
C	10.6	3	11.37	8	−6.73	30	−2.13	31	6.82	26	13.71	3	9.50	6
D	6.9	4	7.85	23	−1.37	24	−1.89	30	4.38	28	5.57	14	4.88	29
E	6.5	5	10.50	14	−3.05	28	16.54	12	8.46	16	6.86	11	8.35	12
F	5.7 (7)	6	1.89	31	−2.27	26	30.93	3	2.66	31	11.59	4	5.31	28
G	5.5	7	8.96	17	−1.53	25	7.63	18	7.28	20	2.04	29	5.60	27
H	5.4 (5)	8	11.65	6	10.59	3	24.89	5	14.57	2	15.95	2	14.77	2
I	5.0	9	10.75	10	.97	21	1.05	27	8.08	17	5.83	13	6.79	19
J	4.5 (8)	10	14.95	1	3.65	15	3.51	25	10.18	8	2.84	24	7.42	15
K	4.4 (8)	11	8.92	18	26.56	1	5.31	22	10.44	7	3.09	23	8.66	10
L	4.3	12	6.22	29	2.82	19	17.62	10	6.89	25	3.47	21	5.95	24
M	4.1	13	10.70	12	8.29	6	4.28	24	9.26	11	7.53	9	8.91	9
N	3.9	14	7.72	24	.59	22	9.57	16	7.04	23	3.74	18	6.14	23
O	3.8 (5)	15	6.44	28	−2.68	27	7.32	19	4.08	29	10.09	6	5.86	26
P	3.7	16	12.71	3	3.52	16	.22	29	9.93	9	7.53	9	9.10	8
Q	3.4	17	10.73	11	9.67	4	23.17	7	13.57	4	10.82	5	12.27	3
R	3.3	18	10.92	9	4.38	14	4.51	23	9.57	10	3.55	20	8.59	11
S	3.2	19	12.25	4	1.40	20	20.04	9	11.27	6	6.92	10	9.37	7
T	3.1	20	9.49	16	3.01	18	10.68	14	6.37	27	3.64	19	5.87	25
U	2.8	21	7.67	25	7.65	8	3.50	26	7.11	22	8.71	8	7.34	17
V	2.7	22	8.38	20	5.76	9	22.78	8	9.25	12	3.30	22	7.38	16
W	2.4 (7)	23	9.84	15	5.64	10	7.84	17	8.04	18	2.05	28	5.95	24
X	2.4	24	8.80	19	3.26	17	17.18	11	8.75	13	2.74	25	6.65	20
Y	2.4	25	6.76	27	7.99	7	13.53	13	8.60	14	2.62	27	6.61	21
Z	2.4 (7)	26	14.36	2	4.72	13	64.17	1	14.42	3	3.76	17	11.55	4
AA	2.2	27	11.75	5	24.36	2	25.89	4	19.11	1	9.61	7	18.14	1
BB	2.1	28	11.63	7	4.83	12	24.49	6	11.72	5	.79	30	7.50	14
CC	2.0	29	6.12	30	8.98	5	6.34	21	7.18	21	5.02	15	7.12	18
DD	1.5	30	10.66	13	4.72	13	.86	28	8.49	15	2.70	26	7.61	13
EE	1.5 (7)	31	8.09	21	5.28	11	6.73	20	7.02	24	23.42	1	9.69	5

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[1] Table 2.A. reads as follows (line 1): College A had a mean annual enrollment growth of 12.1 percent and ranked 1st. Income: FTES tuition and fees income rose 7.1 percent on average, ranked 26th. FTES endowment income rose 0.49 percent on average; ranked 23d, etc.

Note: Numbers in parentheses indicate years where data is not available for entire period.

TABLE 2.B.—*Mean annual percentage growth summary per full time equivalent students: Major expense components* [1]

School	Enrollment growth (percent)	Rank	Total administration (percent)	Rank	Instruction (percent)	Rank	Library (percent)	Rank	Operation and maintenance (percent)	Rank	Total E & G expense (percent)	Rank	Total auxiliaries (percent)	Rank	Student aid (percent)	Rank	Total expenses (percent)	Rank
A	12.1	1	5.56	26	7.41	23	6.34	26	4.68	20	6.35	26	8.51	9	7.51	21	6.83	20
B	10.9	2	9.27	14	6.87	26	6.13	27	-.99	30	5.73	28	6.15	15	-.32	31	5.41	30
C	10.6	3	5.80	25	8.69	16	14.88	7	-2.26	31	5.68	29	20.48	2	17.91	8	9.59	7
D	6.9	4	3.54	31	8.59	19	11.73	14	.09	28	5.29	31	3.71	24	5.95	26	5.05	31
E	6.5	5	10.79	7	6.90	25	12.50	13	7.44	10	8.34	12	8.16	10	9.46	17	8.36	12
F	5.7 (7)	6	6.06	23	3.14	31	6.96	23	9.94	7	5.59	30	10.67	6	3.41	30	5.48	29
G	5.5	7	5.42	27	9.22	13	13.73	9	1.85	26	7.15	21	3.63	25	15.34	10	6.52	22
H	5.4 (5)	8	13.84	4	9.97	10	26.64	3	1.32	27	10.23	7	16.17	4	12.65	13	12.06	3
I	5.0	9	6.87	21	10.46	8	13.60	10	7.34	11	9.10	10	3.83	23	6.47	25	6.22	25
J	4.5 (8)	10	7.20	19	9.31	12	12.97	12	2.80	25	7.51	19	2.40	29	14.04	12	6.47	23
K	4.4 (8)	11	10.19	11	11.66	6	11.16	18	12.44	3	11.41	5	5.20	16	8.44	20	9.52	8
L	4.3	12	5.90	24	6.92	24	6.71	24	6.84	12	6.65	25	4.71	18	6.93	23	6.21	26
M	4.1	13	12.50	5	8.62	18	7.99	21	6.39	15	9.14	9	7.03	12	20.00	6	8.89	10
N	3.9	14	4.24	30	9.15	14	7.97	22	5.56	17	7.11	22	3.45	26	11.06	15	6.16	27
O	3.8 (5)	15	10.10	13	7.79	21	11.26	16	11.29	5	7.70	16	10.44	7	7.00	22	7.86	14
P	3.7	16	5.30	28	10.49	7	49.58	1	3.38	24	9.29	8	8.08	11	23.75	4	9.48	9
Q	3.4	17	10.40	9	11.71	5	19.27	6	21.37	2	13.21	3	16.33	3	17.73	9	13.47	2
R	3.3	18	17.34	3	8.97	15	11.25	17	-.09	29	7.19	20	6.62	14	41.78	2	8.43	11
S	3.2	19	18.88	2	13.73	2	19.38	5	6.16	16	13.09	4	8.70	8	11.77	14	11.49	5
T	3.1	20	7.26	18	5.45	29	8.67	19	9.63	8	6.73	24	3.13	27	10.68	16	6.12	28
U	2.8	21	7.02	20	4.99	30	12.50	13	7.71	9	6.18	27	12.35	5	5.50	28	7.29	18
V	2.7	22	8.49	15	9.83	11	11.27	15	5.18	18	8.79	11	3.02	28	27.66	3	7.31	17
W	2.4 (7)	23	8.14	16	9.98	9	13.33	11	4.13	23	7.87	15	2.21	30	14.58	11	6.26	24
X	2.4	24	10.49	8	7.47	22	6.34	26	6.45	14	7.89	14	4.35	20	8.81	18	6.90	19
Y	2.4	25	8.13	17	8.41	20	6.57	25	4.97	19	7.61	17	5.09	17	3.91	29	6.61	21
Z	2.4 (7)	26	12.05	6	12.33	3	24.57	4	12.09	4	14.63	2	4.68	19	23.54	5	12.29	4
AA	2.2	27	20.80	1	16.22	1	28.18	2	22.43	1	19.06	1	6.88	13	44.09	1	16.90	1
BB	2.1	28	4.72	29	11.89	4	2.81	29	4.50	21	10.59	6	1.10	31	8.55	19	8.08	13
CC	2.0	29	10.18	12	6.28	27	8.52	20	10.22	6	8.27	13	4.33	21	6.78	24	7.42	15
DD	1.5	30	6.62	22	8.63	17	5.70	28	4.21	22	7.09	23	4.32	22	18.75	7	7.32	16
EE	1.5 (7)	31	10.38	10	5.88	28	14.19	8	6.64	13	7.57	18	28.13	1	5.87	27	10.09	6

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[1] Table 2.B reads as follows (line 1): Expenditures: FTES administrative expense rose 5.56 percent on average, ranked 26th. FTES instructional expense rose 7.41 percent on average; ranked 23d, etc.

Note: Numbers in parentheses indicate years where data is not available for entire period.

Similarly, we applaud a college whose FTES Gift income increases substantially, but we hope that FTES Tuition and Fees income growth would remain on the low side since this indicator points to the price which the citizen must pay for his college education.

Therefore, before an attempt is made to interpret this summary, the reader must ask himself what significance attaches to the specific income benefit or cost burden characteristic of each component singled out for attention in Tables 2.A and 2.B. It may also be appropriate to repeat that the growth rates do not relate to aggregate income and expenditures, but to Full Time Equivalent Student (FTES) income and expenditures.

It should therefore not come as a surprise that FTES Endowment income has been declining for the colleges which have experienced the most rapid enrollment escalation.

On the expenditure side, the Library and Student Aid components stand out dramatically. The rank ordering in both instances does not appear to be very closely related (either symmetrically or asymmetrically) to enrollment growth.

Of special interest may be the Student Aid component. For most of the institutions in our sample the difference between FTES Student Aid cost and FTES Student Aid income has been increasing, thus putting an increasing strain on operating budgets. Graph 2.A. depicts this widening aggregate Student Aid subsidy gap. The sharp increase during the last two years of Gift Student Aid income reflects the increase in state scholarship programs.

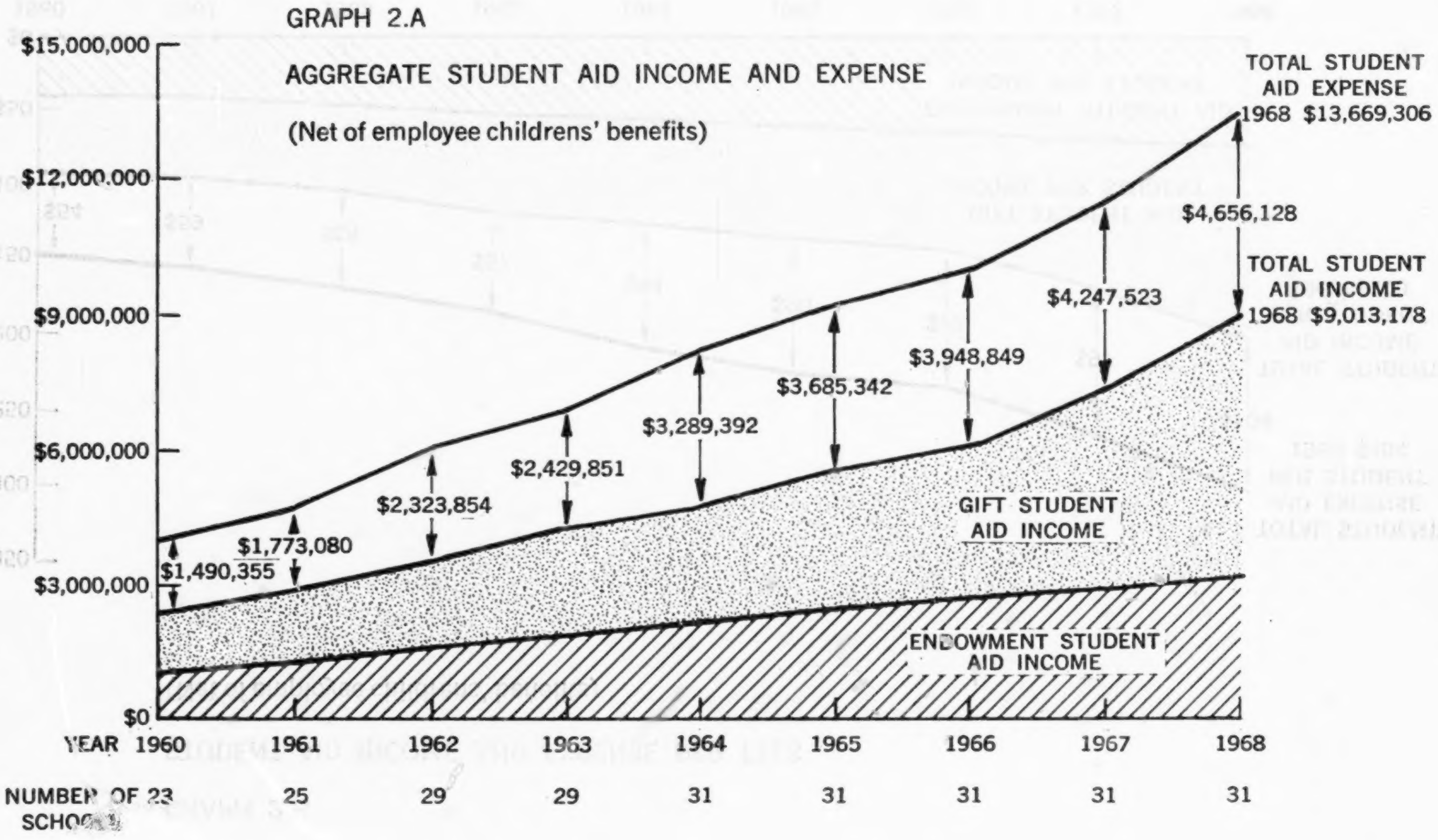
A second illustration of this phenomenon can be seen in Graph 2.B. which compares the FTES total Student Aid expense with FTES Aid income. Once more the widening Student Aid subsidy gap stands out dramatically as a major aspect of college cost escalation, and we must repeat that it has no direct bearing in college operating costs except to the extent to which private colleges have been forced into establishing expensive Offices of Student Aid. In a weak moment one might be tempted to think of the Theater of the Absurd, but at least one is able to point to a fundamental reason of why private colleges are in financial crisis.

Section III contains some supporting tables and comments.

3. SOME KEY CHANGES IN STRUCTURE

With the information at our disposal, we can distinguish three types of changes in the structure of income and expense.

The *first* type of structural analysis concerns each individual institution and consists in determining the relative weight of each major income and expense component. If there are substantial shifts in the relative weights of specific components over a reasonably long period of time, we can say that a structural change has taken place. Section III contains several tables which illustrate this kind of *internal* structural change; a comprehensive report will be included in our final study.



GRAPH 2.A

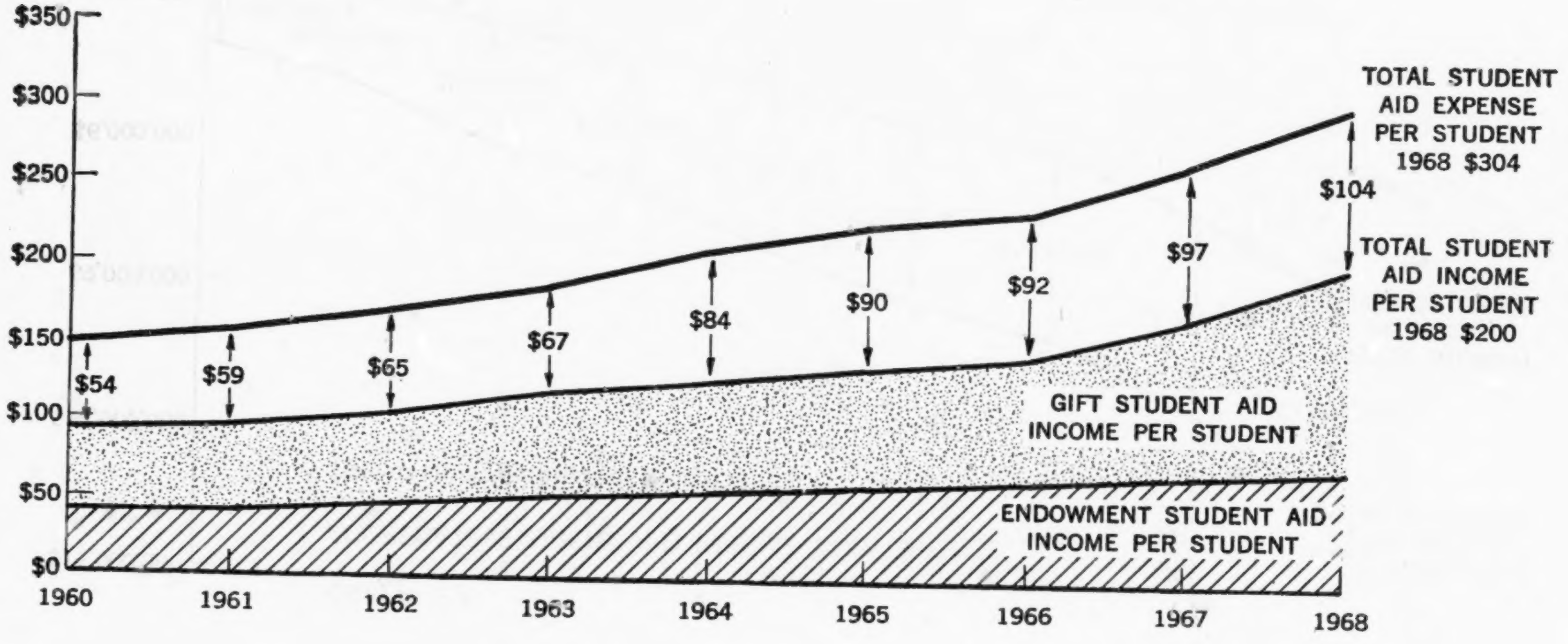
AGGREGATE STUDENT AID INCOME AND EXPENSE

(Net of employee childrens' benefits)

GRAPH 2.B

STUDENT AID INCOME AND EXPENSE PER FTES

(Net of employee childrens' benefits)



Second, taking the sample of colleges as a whole, we may say that a structural change has taken place when a given institution changes its final position relative to all or several other colleges in a given group. Sharp changes in financial position which endure over a reasonable number of years may entail significant *qualitative* changes as well.

Tables 2.A. and 2.B. allow us to see some of the more obvious structural changes of this type by comparing mean annual FTES growth rates for the most important income and expense components. But the reader should be careful and not read too much into or from the tables.

Take, for instance, College Z (Table 3.A. below) which has enjoyed a FTES growth of 14.42 percent on average for the period of seven years for which we have its data for total Education and General income, and 11.55 percent for Total Income. If we compare College Z with College F we notice that the latter has had a FTES Educational and General annual income growth of only 2.66 percent on average and of 5.31 percent for Total Income. Thus, the additional income available over time per FTES has risen more rapidly for College Z than for College F. Another interesting comparison involves College B whose FTES annual growth rates for the same components has been 3.83 and 3.96 percent respectively.

The colleges with the most rapid enrollment growth have on balance done less well in this respect than those with less enrollment growth. We call the reader's attention to the ranking of specific institutions. The problem is reminiscent of what economists encounter when they

TABLE 3.A.—*Full-time equivalent student (FTES) mean annual income growth—Educational and general income, and total income*

School	Enrollment growth, percent	Rank	Total educational and general income, percent	Rank	Total income, percent	Rank
A	12.1	1	7.44	19	6.57	22
B	10.9	2	3.83	30	3.96	30
C	10.6	3	6.82	26	9.50	6
D	6.9	4	4.38	28	4.88	29
E	6.5	5	8.46	16	8.35	12
F	5.7 (7)	6	2.66	31	5.31	28
G	5.5	7	7.28	20	5.60	27
H	5.4 (5)	8	14.57	2	14.77	2
I	5.0	9	8.08	17	6.79	19
J	4.5 (8)	10	10.18	8	7.42	15
K	4.4 (8)	11	10.44	7	8.66	10
L	4.3	12	6.89	25	5.95	24
M	4.1	13	9.26	11	8.91	9
N	3.9	14	7.04	23	6.14	23
O	3.8 (5)	15	4.08	29	5.86	26
P	3.7	16	9.93	9	9.10	8
Q	3.4	17	13.57	4	12.27	3
R	3.3	18	9.57	10	8.59	11
S	3.2	19	11.27	6	9.37	7
T	3.1	20	6.37	27	5.87	25
U	2.8	21	7.11	22	7.34	17
V	2.7	22	9.25	12	7.38	16
W	2.4 (7)	23	8.04	18	5.95	24
X	2.4	24	8.75	13	6.65	20
Y	2.4	25	8.60	14	6.61	21
Z	2.4 (7)	26	14.42	3	11.55	4
AA	2.2	27	19.11	1	18.14	1
BB	2.1	28	11.72	5	7.50	14
CC	2.0	29	7.18	21	7.12	18
DD	1.5	30	8.49	15	7.61	13
EE	1.5 (7)	31	7.02	24	9.69	5

Note: Numbers in parentheses indicate years where date is not available for entire period.

TABLE 3.B.—*Full-time equivalent student (FTES) mean annual expense growth—Educational and general expense and total expense*

School	Enrollment growth (percent)	Rank	Total educational and general expense (percent)	Rank	Total expenses (percent)	Rank
A	12.1	1	6.35	26	6.83	23
B	10.9	2	5.73	28	5.41	30
C	10.6	3	5.68	29	9.59	0
D	6.9	4	5.29	31	5.05	37
E	6.5	5	8.34	12	8.36	11
F	5.7 (7)	6	5.59	30	5.48	22
G	5.5	7	7.15	21	6.52	29
H	5.4 (5)	8	10.23	7	12.06	2
I	5.0	9	9.10	10	6.22	23
J	4.5 (8)	10	7.51	19	6.47	25
K	4.4 (8)	11	11.41	5	9.52	8
L	4.3	12	6.65	25	6.21	26
M	4.1	13	9.14	9	8.89	10
N	3.9	14	7.11	22	6.16	27
O	3.8 (5)	15	7.70	16	7.86	14
P	3.7	16	9.29	8	9.48	9
Q	3.4	17	13.21	3	13.47	2
R	3.3	18	7.19	20	8.43	11
S	3.2	19	13.09	4	11.49	5
T	3.1	20	6.73	24	6.12	28
U	2.8	21	6.18	27	7.29	18
V	2.7	22	8.79	11	7.31	17
W	2.4 (7)	23	7.87	15	6.26	24
X	2.4	24	7.89	14	6.90	19
Y	2.4	25	7.61	17	6.61	21
Z	2.4 (7)	26	14.63	2	12.29	4
AA	2.2	27	19.06	1	16.90	1
BB	2.1	28	10.59	6	8.08	13
CC	2.0	29	8.27	13	7.42	15
DD	1.5	30	7.09	23	7.32	16
EE	1.5 (7)	31	7.57	18	10.09	6

Note: Numbers in parentheses indicate years where data is not available for entire period.

are called upon to compare the differing growth rates of a group of national economies, some of which are highly developed while others are just taking off. We should expect the more "advanced" colleges to experience slower growth rates than the "developing" schools. If the colleges used in the above illustrations had started their growth race from equal positions of *quality*, Colleges F and B could be expected to face eventually a rather serious competitive problem vis-a-vis College Z.

The institutions in our sample are indeed of highly differentiated quality. The latter need not relate solely to the educational services, but may pertain to such factors as climate, architecture, location in urban or rural settings, age, condition of plant, availability of capital, and all manner of assumed styles, to mention but the most obvious elements. We have accumulated some data which may allow us to be more specific about quality differentials at a later time. Unfortunately, the information is not yet in a form suitable for inclusion in this report. It is only fair to point out that as of now there exist only the vaguest *standards* for the measurement of quality in private higher education.

Therefore, the often sharply different growth rates for our FTES components are intended to provide us with but the broadest kind of potential structural change as we understand the concept in the second sense defined above.

We should like to illustrate this type of structural change further by commenting once more on an aspect of FTES Student Aid expense.

Table 3.C. shows how the 31 colleges fared in relation to annual FTES Student Aid expense growth. Table 3.D. summarizes how each college ranked annually relative to the others in terms of FTES Student Aid spending. We ranked actual dollar amounts, not percentages, such that the school with the highest rank paid out the largest amount of money whereas the college with the lowest rank spent less in actual dollars.

College C has experienced an above average mean annual enrollment growth rate of 10.6 percent, while its FTES Student Aid spending grew by 17.91 percent on average. We have enclosed these data on Table 3.D. to identify the college quickly. It has shifted its relative rank noticeably throughout the period, and on balance it has substantially improved its relative position vis-a-vis other schools. The main reason for its high rank during the last three years is that it is located in a state which has enacted a generous student scholarship program.

In contrast, Colleges B and BB have experienced definite relative rank deterioration. College B has had a mean annual enrollment growth of 10.9 percent and an FTES Student Aid expense growth of −.32 percent on average. After ranking very high on Table 3.D., there occurs a noticeable deterioration during the second half of the period. The case for College BB is somewhat different. An annual enrollment growth of 2.1 percent is matched with an annual FTES Student Aid cost growth of 8.55 percent. In spite of this favorable relationship, the College's rank is among the lowest during the last four years.

It must be pointed out once more that we are comparing dollars spent, such that *deterioration in rank means loss of relative competitive position.* College C is much better off than it was during the early 1960's and Colleges B and BB are worse off. In this expense category we compete for students, and structural change means that it is easier than it was (or more difficult than it was) to obtain the desired quality and number of new students each year. A rough accounting suggests that 8 colleges are now worse off, that 8 are better off, and that 15 have had on balance a reasonably stable experience.[8]

Section III contains some additional information on Student Aid.

TABLE 3.C.—*Annual FTES student aid expense growth*

School	Enrollment growth percent	Rank	Student aid, percent	Rank	School	Enrollment growth percent	Rank	Student aid, percent	Rank
A	12.1	1	7.51	21	Q	3.4	17	17.73	9
B	10.9	2	−.32	31	R	3.3	18	41.78	2
C	10.6	3	17.91	8	S	3.2	19	11.77	14
D	6.9	4	5.95	26	T	3.1	20	10.68	16
E	6.5	5	9.46	17	U	2.8	21	5.50	28
F	5.7 (7)	6	3.41	30	V	2.7	22	27.66	3
G	5.5	7	15.34	10	W	2.4 (7)	23	14.58	11
H	5.4 (5)	8	12.65	13	X	2.4	24	8.81	18
I	5.0	9	6.47	25	Y	2.4	25	3.91	29
J	4.5 (8)	10	14.04	12	Z	2.4 (7)	26	23.54	5
K	4.4 (8)	11	8.44	20	AA	2.2	27	44.09	1
L	4.3	12	6.92	23	BB	2.1	28	8.55	19
M	4.1	13	20.00	6	CC	2.0	29	6.78	24
N	3.9	14	11.06	15	DD	1.5	30	18.75	7
O	3.8 (5)	15	7.00	22	EE	1.5 (7)	31	5.87	27
P	3.7	16	23.75	4					

Note—Numbers in parentheses indicate years where data is not available for entire period.

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[8] When noting changes in rank over time, it must be remembered that data was available for only 23 colleges in 1960, 25 in 1961, 29 in 1962 and 1963, and 31 colleges from 1964 to 1968.

TABLE 3.D.—*FTES student aid ranking (net of employee childrens' benefits)*

College	1960	1961	1962	1963	1964	1965	1966	1967	1968
A	13	13	14	18	16	20	14	21	24
B	8	7	9	13	11	15	23	30	31
C	10	15	15	6	4	5	5	4	5
D	2	3	6	7	14	14	13	14	7
E	1	1	1	1	1	1	2	1	1
F			3	5	13	10	16	9	6
G	12	9	11	12	10	6	6	6	8
H					24	25	26	17	22
I	5	10	7	8	7	7	4	11	12
J		8	16	17	20	13	10	12	11
K		4	4	4	5	8	9	8	13
L	9	23	10	11	12	11	17	18	25
M	21	11	26	29	30	30	30	27	27
N	14	17	19	24	27	27	25	26	26
O					2	2	1	2	2
P	22	25	29	28	31	31	31	31	28
Q	17	18	20	27	26	24	24	20	18
R	23	24	28	25	29	26	27	19	15
S	19	12	25	26	19	19	15	25	29
T	4	2	5	3	6	4	8	5	4
U	6	6	12	15	17	18	18	16	17
V	18	21	23	14	8	9	7	10	14
W			24	21	25	23	21	22	23
X	7	14	18	19	22	22	22	24	19
Y	3	5	8	10	9	16	12	13	16
Z			27	23	28	28	29	28	20
AA	20	20	22	16	18	17	11	7	3
BB	16	19	21	20	21	29	28	29	30
CC	11	22	13	9	15	12	19	23	21
DD	15	16	17	22	23	21	20	15	10
EE			2	2	3	3	3	3	9

A *third* type of structural change is reminiscent of *The Sixty College Study . . . A Second Look*. This study was the second systematic attempt during the 1950's to define the basic income and expenditure structure of a group of private colleges and universities. The investigation centered on determining the relative percentage weights of major and minor income and expense components in college operating accounts. Among other things, Irwin K. French then expressed the hope that the data would help in formulating "guiding principles for the fiscal administration of colleges." [9]

The information on which this chapter is based resulted from an investigation which has as one of its original purposes the updating of *The Sixty College Study*. Instead we have been forced to change our emphasis, because we find few "guiding" principles in this type of structural analysis.

The purpose of *The Sixty College Study* was among other things to determine whether one might find a normal or typical pattern of weights of specific income and expense components. It was then hoped and suggested that such norms (usually in the guise of "normal statistical distributions"), if found, might serve as rallying points in the allocation of resources in long range planning budgets. For instance, one might decide that 5 percent of total Educational and General expense should be allocated to the Library budget, not because this amount was required in order to build up a sound collection of books and periodicals, but because *The Sixty College Study* might show that both average and median allocations had in fact run in this vicinity—which they did.

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[9] *The Sixty College Study. . . . A Second Look*, National Federation of College and University Business Officers Associations, 1960, p. 3.

We believe that percentage income and expense distribution data are not very useful for purposes of long range planning; we believe that used in this manner they are actually dangerous. However, as a historical record, indicating long range changes in the basic structure of major income and expense components this approach is of interest. Among other things it enables us to assess in an approximate manner what specific changes in priorities and emphasis may have taken place. Therefore we have made a few scatter diagrams similar to those which the reader can find in *The Sixty College Study* (pp. 47, 57). The diagrams have some interesting properties and reveal a few significant changes.

Our range of Endowment income (not counting Student Aid Endowment income) is somewhat narrower than that found in *The Sixty College Study*. Our Graph 3.A. ranges between about 35 and 2.5 percent of Educational and General income, not counting some extreme cases. For the sample as a whole, the weight of Endowment income declines steadily from 17.8 percent in 1960 to 15.1 percent in 1968. The scatter diagram, however, suggests that there really are two types of colleges: one group whose endowment income represents a declining share of total income, and another which seems to either hold its own or even improve its position slightly. It may be appropriate to compare the scatter with the Endowment income growth summary (Table 3.E., below). In Section III the Endowment income distribution is rendered for each college in the sample.

Compared to *The Sixty College Study* our figures for Tuition and Fees income show a perhaps surprising development, especially after all the news one has heard about tuition inflation. Before being misled by the scatter diagram one is well advised to take another look at FTES Tuition income growth (Table 3.F., below). Graph 3.B. starts out with a cluster within the narrow range of slightly more than 80 percent at the top and 60 percent at the bottom. This spread is much narrower than in *The Sixty College Study*, probably mostly because of the more homogeneous nature of our sample.

Two interesting things happen to the pattern of dots. First, the spread widens considerably, especially if we ignore the two extreme and low cases through 1963. Second, a bulge appears on the scatter diagram; this tops out and declines by 1967–68, thus suggesting the increasing importance of other income sources. For the group as a whole, Tuition and Fees income starts with a percentage of 66.7 in 1960, moves up to 68.4 by 1963, declines to 66.6 percent in 1964, then increases again to 68 percent in 1966, and finally declines to 67.9 percent in 1967 and 67.4 percent in 1968. The main compensating factors are the increasing weight of gifts and a category of miscellaneous income. Section III will render the detail of Tuition and Fees income for all colleges.

GRAPH 3.A. ENDOWMENT INCOME AS % OF E & G INCOME

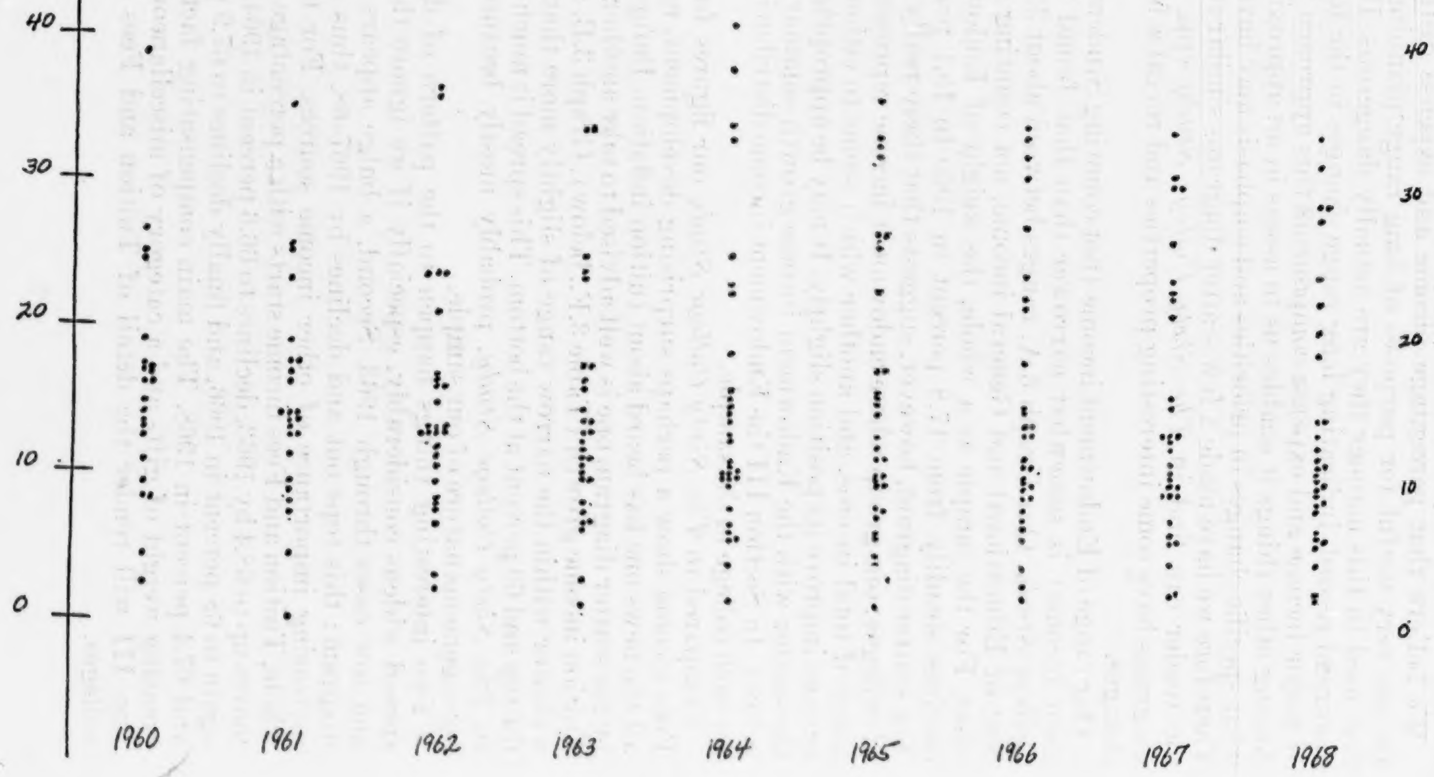


TABLE 3.E.—*FTES endowment income annual growth and rank*

School	Enrollment growth (percent)	Rank	Endowment income (percent)	Rank	School	Enrollment growth (percent)	Rank	Endowment income (percent)	Rank
A	12.1	1	.49	23	Q	3.4	17	9.67	4
B	10.9	2	−3.27	29	R	3.3	18	4.38	14
C	10.6	3	−6.73	30	S	3.2	19	1.40	20
D	6.9	4	−1.37	24	T	3.1	20	3.01	18
E	6.5	5	−3.05	28	U	2.8	21	7.65	8
F	5.7 (7)	6	−2.27	26	V	2.7	22	5.76	9
G	5.5	7	−1.53	25	W	2.4 (7)	23	5.64	10
H	5.4 (5)	8	10.59	3	X	2.4	24	3.26	17
I	5.0	9	.97	21	Y	2.4	25	7.99	7
J	4.5 (8)	10	3.65	15	Z	2.4 (7)	26	4.72	13
K	4.4 (8)	11	26.56	1	AA	2.2	27	24.36	2
L	4.3	12	2.82	19	BB	2.1	28	4.83	12
M	4.1	13	8.29	6	CC	2.0	29	8.98	5
N	3.9	14	.59	22	DD	1.5	30	4.72	13
O	3.8 (5)	15	−2.68	27	EE	1.5 (7)	31	5.28	11
P	3.7	16	3.52	16					

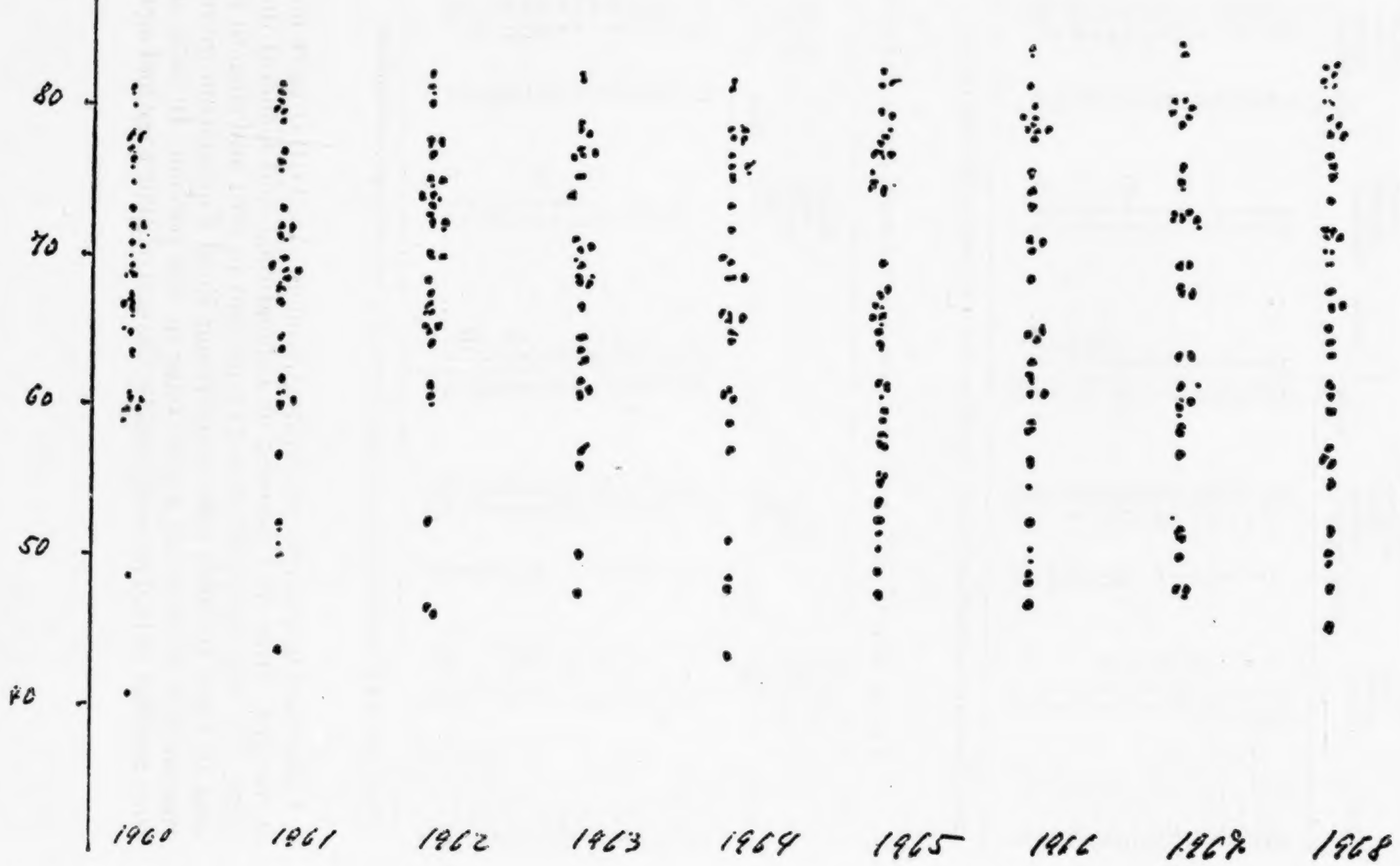
Note: Numbers in parentheses indicate years where data is not available for entire period.

TABLE 3.F.—*FTES tuition and fees income annual growth and rank*

School	Enrollment growth (percent)	Rank	Tuition and fees (percent)	Rank	School	Enrollment growth (percent)	Rank	Tuition and fees (percent)	Rank
A	12.1	1	7.10	26	Q	3.4	17	10.73	11
B	10.9	2	7.91	22	R	3.3	18	10.92	9
C	10.6	3	11.37	8	S	3.2	19	12.25	4
D	6.9	4	7.85	23	T	3.1	20	9.49	16
E	6.5	5	10.50	14	U	2.8	21	7.67	25
F	5.7 (7)	6	1.89	31	V	2.7	22	8.38	20
G	5.5	7	8.96	17	W	2.4 (7)	23	9.84	15
H	5.4 (5)	8	11.65	6	X	2.4	24	8.80	19
I	5.0	9	10.75	10	Y	2.4	25	6.76	27
J	4.5 (8)	10	14.95	1	Z	2.4 (7)	26	14.36	2
K	4.4 (8)	11	8.92	18	AA	2.2	27	11.75	5
L	4.3	12	6.22	29	BB	2.1	28	11.63	7
M	4.1	13	10.70	12	CC	2.0	29	6.12	30
N	3.9	14	7.72	24	DD	1.5	30	10.66	13
O	3.8 (5)	15	6.44	28	EE	1.5 (7)	31	8.09	21
P	3.7	16	12.71	3					

Note: Numbers in parentheses indicate years where data is not available for entire period.

Gifts for Operations (excluding Student Aid Gifts) have moved up in weight; from 12.1 percent of Educational and General income in 1960, they first dropped off to 11.9 percent in 1961 and then to 11.0 percent in 1962. In 1963, reflecting strong Ford Foundation giving, they rose to 12.2 percent and a year later to 13.8 percent. In 1965 and 1966 they receded to 12.6 percent, and by the end of 1968 they had again risen



GRAPH 3.B. TUITION AND FEES INCOME % EDUCATIONAL AND GENERAL INCOME

to 13.0 percent. The scatter diagram (Graph 3.C, below) reflects this wavelike movement. A comparison with *The Sixty College Study* points out that our sample of colleges are spread apart less widely than the group used in the 1950's. Furthermore, the median and mean tend to move lower in our study. Thus, historically, the weight of Gifts for Operations is less today than during the 1950's. Without another quick look at FTES Gift growth figures, however, we would be misled (Table 3.G.); Gifts for Operations have shown a remarkable growth, in the aggregate and on a FTES basis. As a matter of fact, *the growth of gift income has surpassed that of any other income sub-group.*

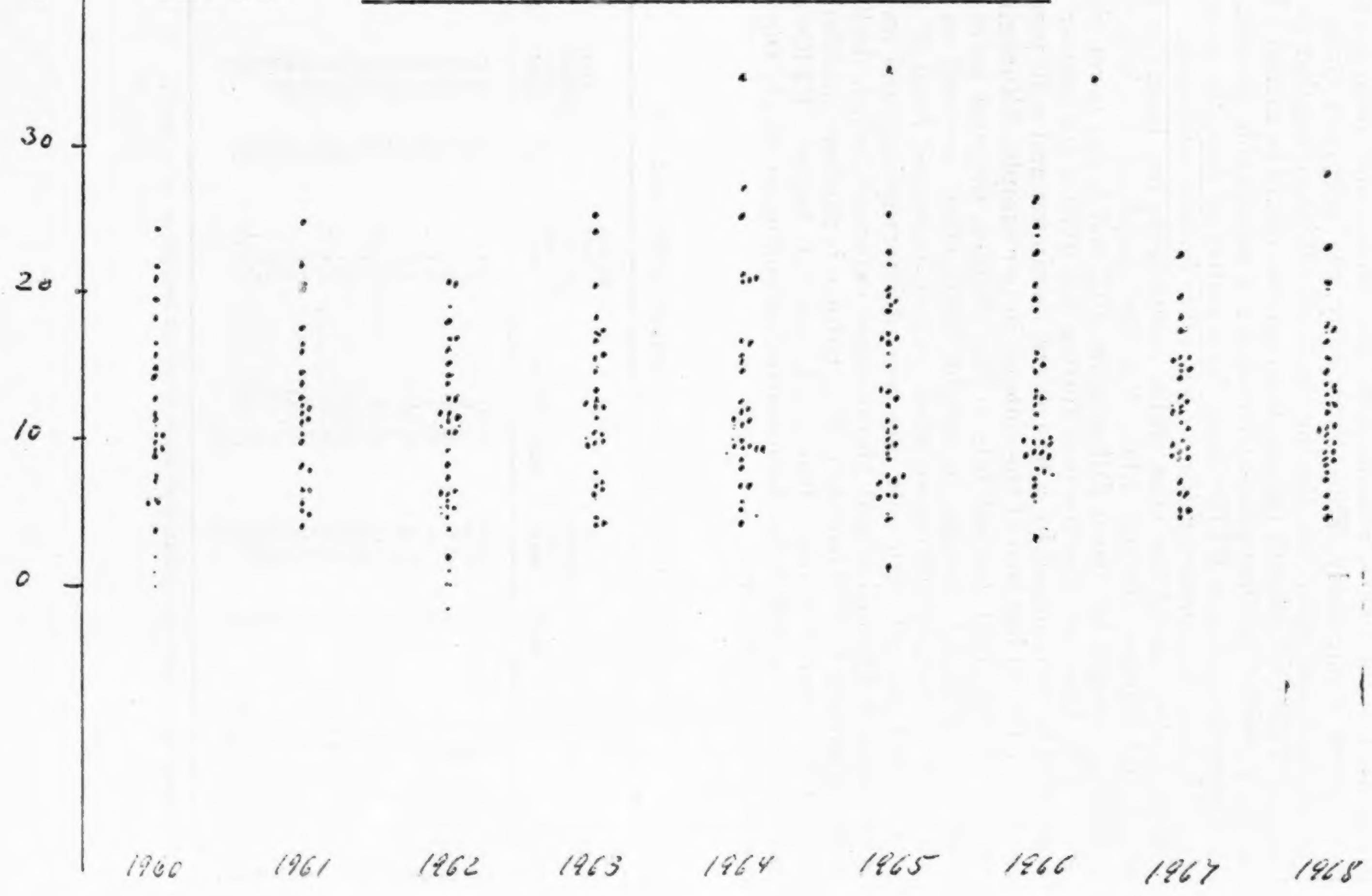
Historically, one of the most stable components has been the Instructional expense (Graph 3.D.). For the sample as a whole, the percentage weight has never fallen below 49.7 and it has never risen above 50.3. Also, as was the case during the 1950's, the scatter has continued to be bounded by a 60 percent maximum and a 40 percent minimum for all but two of the colleges in our sample. Although we are not including all the exhibits in this chapter, we must point out that the significant changes in weight distribution occurred on the one hand in Administrative expenses (which increased from 27 percent to 28.3 percent with only one year of interruption) and on the other hand in Operation and Maintenance expenses (which declined from 18 percent to 15.9 percent). This pattern is further amplified by the FTES growth record (Tables 3.I. and 3.J. below). FTES cost has risen relatively fast for Administration and quite slowly for Operations and Maintenance.

TABLE 3.G.—*FTES gift income annual growth and rank*

School	Enrollment growth, (percent)	Rank	Gift income (percent)	Rank	School	Enrollment growth, (percent)	Rank	Gift income (percent)	Rank
A	12.1	1	9.60	15	Q	3.4	17	23.17	7
B	10.9	2	32.34	2	R	3.3	18	4.51	23
C	10.6	3	−2.13	31	S	3.2	19	20.04	9
D	6.9	4	−1.89	30	T	3.1	20	10.68	14
E	6.5	5	16.54	12	U	2.8	21	3.50	26
F	5.7 (7)	6	30.93	3	V	2.7	22	22.78	8
G	5.5	7	7.63	18	W	2.4 (7)	23	7.84	17
H	5.4 (5)	8	24.89	5	X	2.4	24	17.18	11
I	5.0	9	1.05	27	Y	2.4	25	13.53	13
J	4.5 (8)	10	3.51	25	Z	2.4 (7)	26	64.17	1
K	4.4 (8)	11	5.31	22	AA	2.2	27	25.89	4
L	4.3	12	17.62	10	BB	2.1	28	24.49	6
M	4.1	13	4.28	24	CC	2.0	29	6.34	21
N	3.9	14	9.57	16	DD	1.5	30	.86	28
O	3.8 (5)	15	7.32	19	EE	1.5 (7)	31	6.73	20
P	3.7	16	.22	29					

Note: Numbers in parentheses indicate years where data is not available for entire period;

GRAPH 3.C. GIFTS FOR OPERATIONS AS % EDUCATIONAL AND GENERAL INCOME



GRAPH 3.D. INSTRUCTIONAL EXPENSE AS % OF EDUCATIONAL AND GENERAL EXPENSE

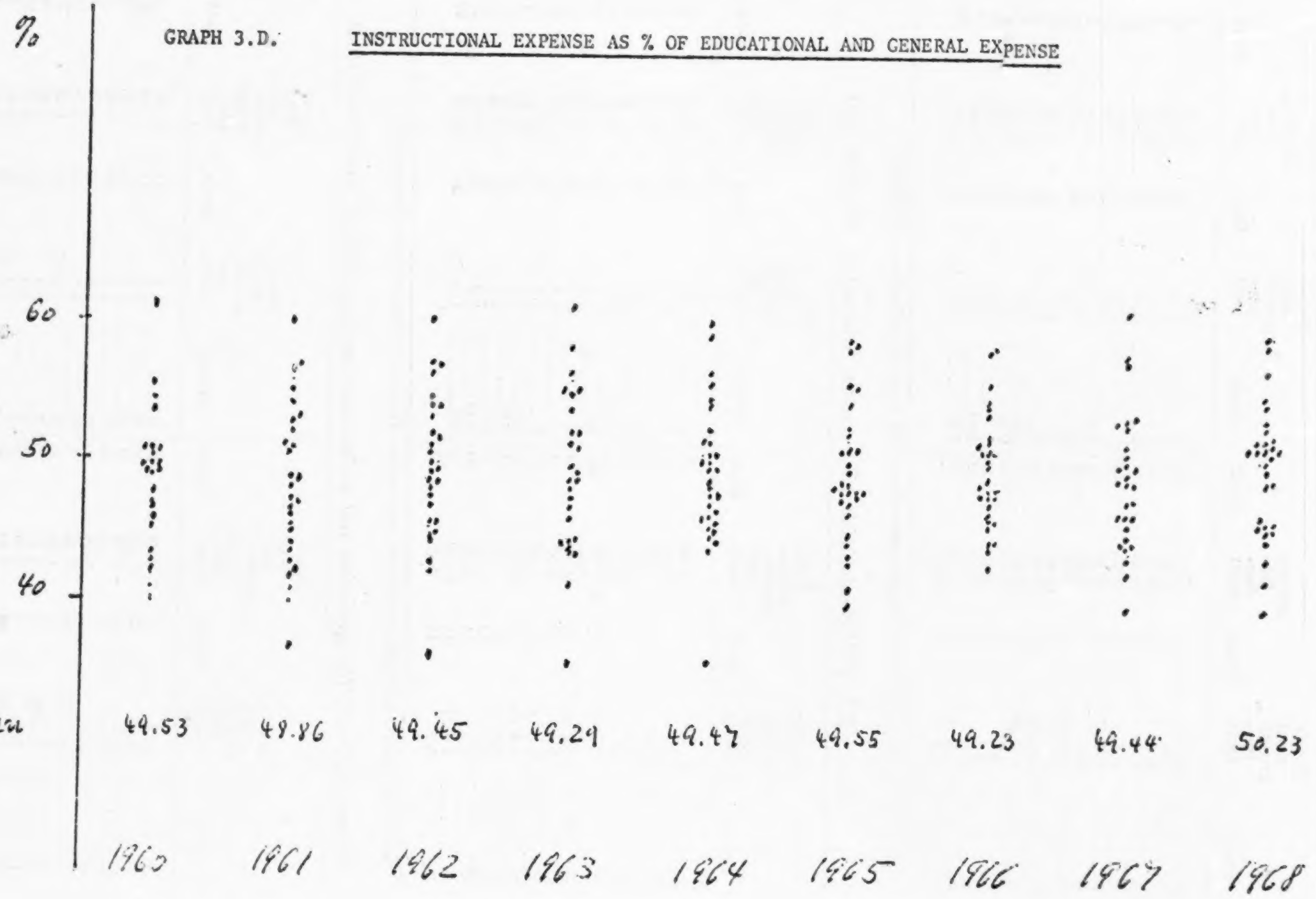


TABLE 3.H.—*FTES instructional expense annual growth and rank*

School	Enrollment growth (percent)	Rank	Instruction (percent)	Rank	School	Enrollment growth (percent)	Rank	Instruction (percent)	Rank
A	12.1	1	7.41	23	Q	3.4	17	11.71	5
B	10.9	2	6.87	26	R	3.3	18	8.97	15
C	10.6	3	8.69	16	S	3.2	19	13.73	2
D	6.9	4	8.59	19	T	3.1	20	5.45	29
E	6.5	5	6.90	25	U	2.8	21	4.99	30
F	5.7 (7)	6	3.14	31	V	2.7	22	9.83	11
G	5.5	7	9.22	13	W	2.4 (7)	23	9.98	9
H	5.4 (5)	8	9.97	10	X	2.4	24	7.47	22
I	5.0	9	10.46	8	Y	2.4	25	8.41	20
J	4.5 (8)	10	9.31	12	Z	2.4 (7)	26	12.33	3
K	4.4 (8)	11	11.66	6	AA	2.2	27	16.22	1
L	4.3	12	6.92	24	BB	2.1	28	11.89	4
M	4.1	13	8.62	18	CC	2.0	29	6.28	27
N	3.9	14	9.15	14	DD	1.5	30	8.63	17
O	3.8 (5)	15	7.79	21	EE	1.5 (7)	31	5.88	28
P	3.7	16	10.49	7					

Note: Numbers in parentheses indicate years where data is not available for entire period.

TABLE 3.I. *FTES administration expense, annual growth, and rank*

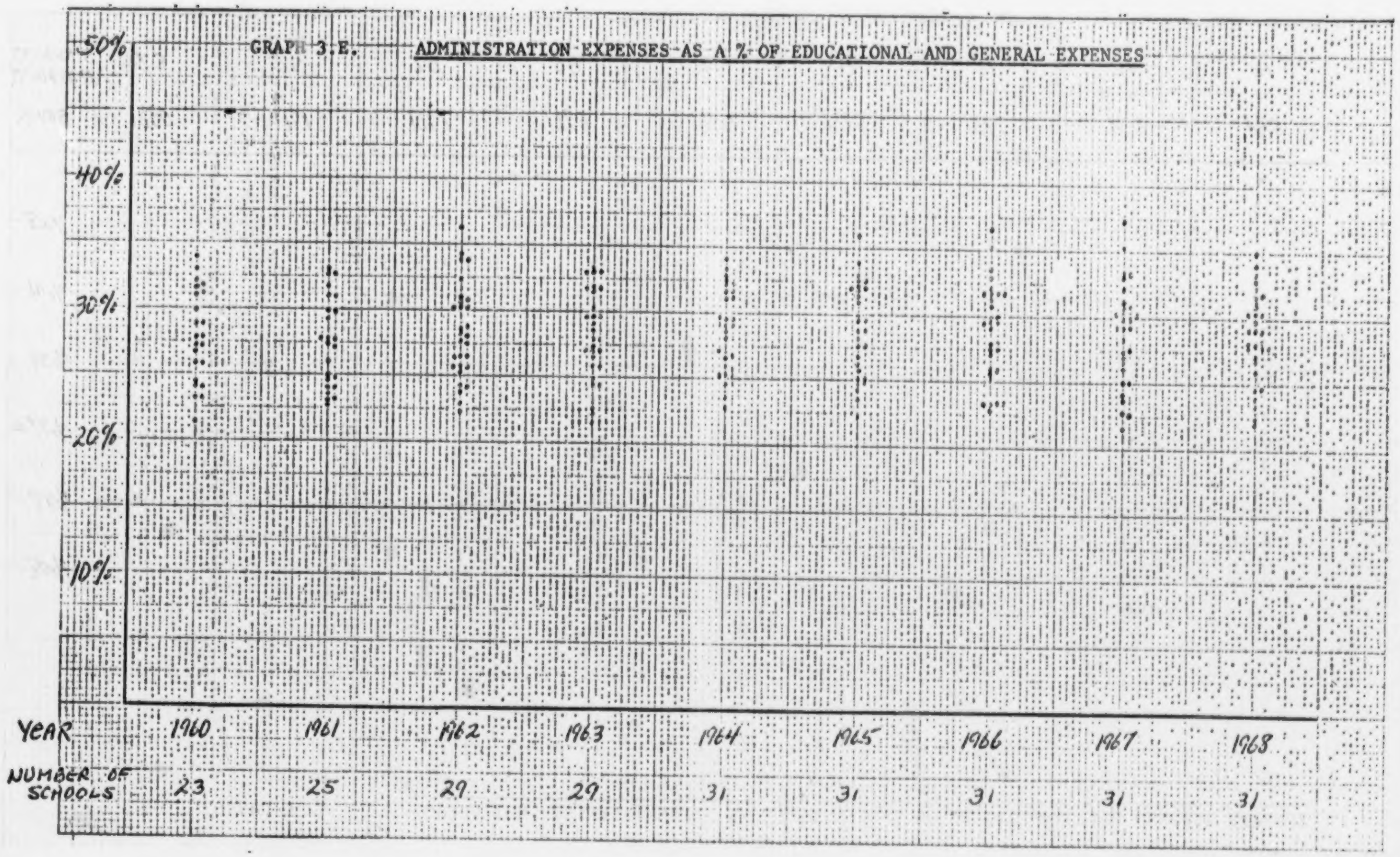
School	Enrollment growth (percent)	Rank	Total administration (percent)	Rank	School	Enrollment growth (percent)	Rank	Total administration (percent)	Rank
A	12.1	1	5.56	26	Q	3.4	17	10.40	9
B	10.9	2	9.27	14	R	3.3	18	17.34	3
C	10.6	3	5.80	25	S	3.2	19	18.88	2
D	6.9	4	3.54	31	T	3.1	20	7.26	18
E	6.5	5	10.79	7	U	2.8	21	7.02	20
F	5.7 (7)	6	6.06	23	V	2.7	22	8.49	15
G	5.5	7	5.42	27	W	2.4 (7)	23	8.14	16
H	5.4 (5)	8	13.84	4	X	2.4	24	10.49	8
I	5.0	9	6.87	21	Y	2.4	25	8.13	17
J	4.5 (8)	10	7.20	19	Z	2.4 (7)	26	12.05	6
K	4.4 (8)	11	10.19	11	AA	2.2	27	20.80	1
L	4.3	12	5.90	24	BB	2.1	28	4.72	29
M	4.1	13	12.50	5	CC	2.0	29	10.18	12
N	3.9	14	4.24	30	DD	1.5	30	6.62	22
O	3.8 (5)	15	10.10	13	EE	1.5 (7)	31	10.38	10
P	3.7	16	5.30	28					

Note: Numbers in parentheses indicate years where data is not available for entire period.

TABLE 3.J.—*FTES operation and maintenance expense annual growth and rank*

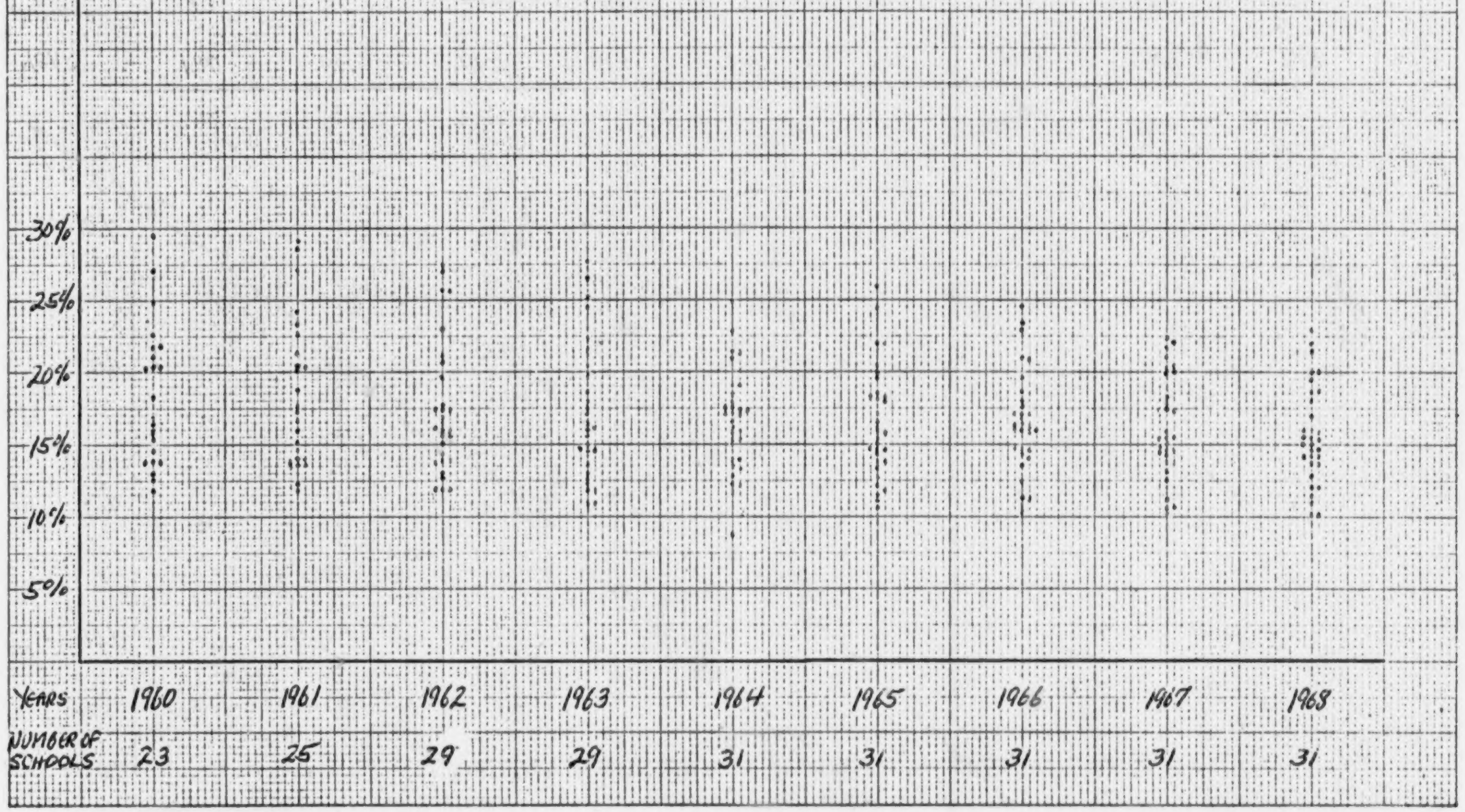
School	Enrollment growth (percent)	Rank	Operations and maintenance (percent)	Rank	School	Enrollment growth (percent)	Rank	Operations and maintenance (percent)	Rank
A	12.1	1	4.68	20	Q	3.4	17	21.37	2
B	10.9	2	−.99	30	R	3.3	18	−.09	29
C	10.6	3	−2.26	31	S	3.2	19	6.16	16
D	6.9	4	.09	28	T	3.1	20	9.63	8
E	6.5	5	7.44	10	U	2.8	21	7.71	9
F	5.7 (7)	6	9.94	7	V	2.7	22	5.18	18
G	5.5	7	1.85	26	W	2.4 (7)	23	4.13	23
H	5.4 (5)	8	1.32	27	X	2.4	24	6.45	14
I	5.0	9	7.34	11	Y	2.4	25	4.97	19
J	4.5 (8)	10	2.80	25	Z	2.4 (7)	26	12.09	4
K	4.4 (8)	11	12.44	3	AA	2.2	27	22.43	1
L	4.3	12	6.84	12	BB	2.1	28	4.50	21
M	4.1	13	6.39	15	CC	2.0	29	10.22	6
N	3.9	14	5.56	17	DD	1.5	30	4.21	22
O	3.8 (5)	15	11.29	5	EE	1.5 (7)	31	6.64	13
P	3.7	16	3.38	24					

Note: Numbers in parentheses indicate years where data is not available for entire period.

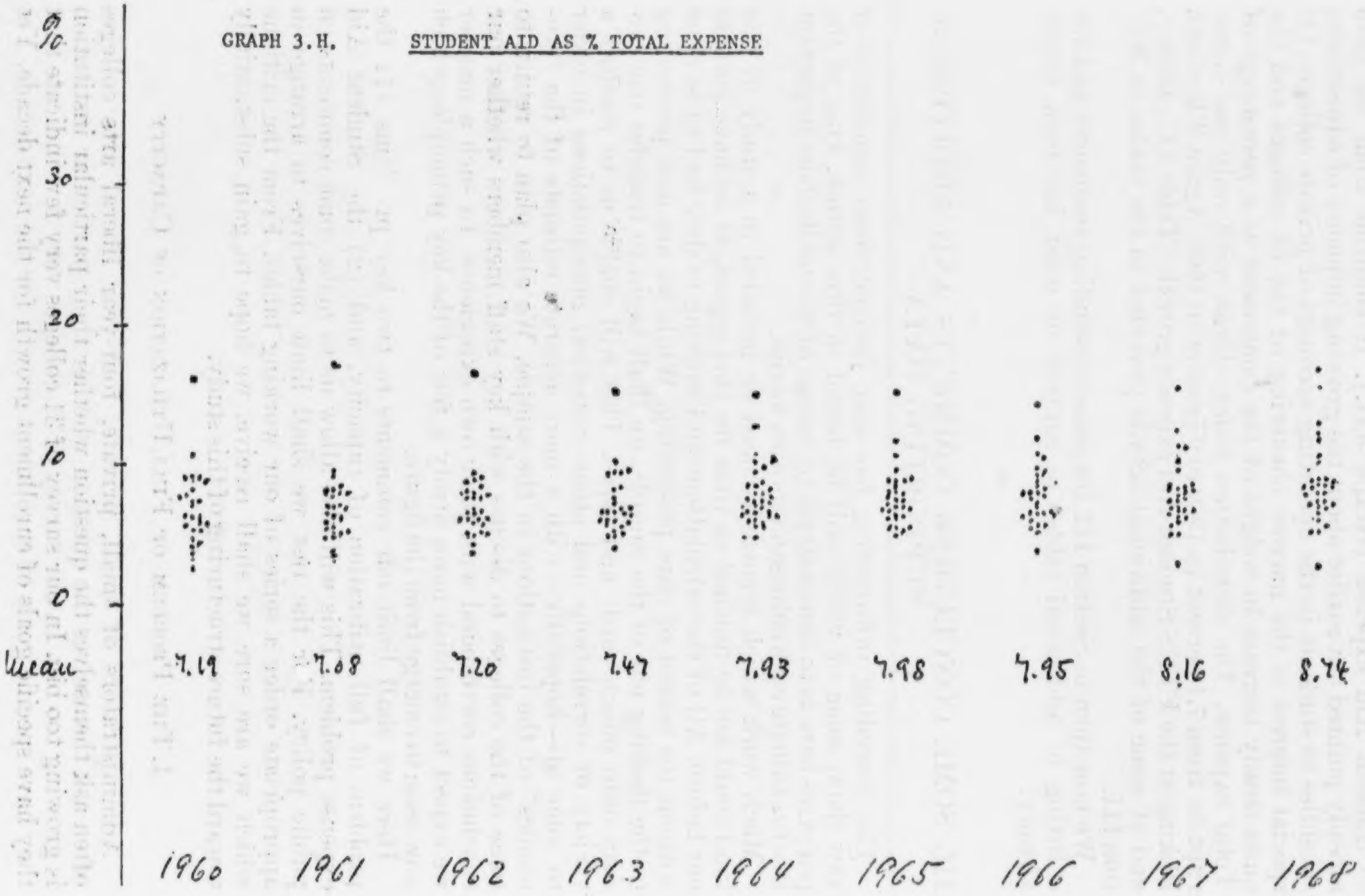


GRAPH 3.E. ADMINISTRATION EXPENSES AS A % OF EDUCATIONAL AND GENERAL EXPENSES

GRAPH 3.F. OPERATION AND MAINTENANCE EXPENSES AS A % OF EDUCATIONAL AND GENERAL EXPENSE



GRAPH 3.H. STUDENT AID AS % TOTAL EXPENSE



The final scatter diagram which will be of interest here pertains to Student Aid expense (Graph 3.H.). It confirms what we have already pointed out earlier about the growing influence of educational subsidies to students in the operating accounts of private colleges. Of special interest is the narrow clustering of the 31 colleges and the quite steady increase in weight of the component as a percentage of Total expense. The distribution index climbs with only one interruption from 7.4 percent in 1960 to 9 percent in 1968. Again it is worth looking at the FTES Student Aid expense growth (Table 3.C., above), and at some of the additional details provided in the tables in Section III.

We now turn to Section III for some concluding comments and for a listing of additional tables in support of what has been shown already.

III. SOME CONCLUDING COMMENTS AND ADDITIONAL SUPPORTING DATA

The preceding information has been derived from summaries of raw data, some of which will be found in this section. One of the purposes here is to demonstrate by means of the tables how important it is to evaluate each college on its own merits.

Much work which eventually must be included in a study of this kind could not be finished on time for this report, as we have pointed out before. All of the calculations and ranking to date had to be done without the benefit of data processing. While we are now proceeding to the fleshing out of the sample, we shall begin to transfer our raw data onto punch cards and tapes. This will enable us to conduct a variety of correlations and other statistical manipulations in order to come up—hopefully—with a more accurate estimate of the "economics" of the institutions in the sample. We also plan to return to some of the colleges to discuss with key staff members whether our conclusions correspond with their own experience. In such a manner we expect to establish more firmly a few of the key principles which now seem to emerge from the figure.

Here we shall limit our comments to two key problems (1) the problem of full utilization of capacity, and (2) the Student Aid expense problem. This will also allow us to make some comments on public policy. For the rest we shall limit ourselves to arrange in appropriate order a series of our working tables. From the critique which we are sure we shall receive, we hope to gain substantially toward the future structuring of this study.

1. The Problem of Full Utilization of Capacity

Administrators of small, private, four-year liberal arts colleges often ask themselves the question whether their particular institution is growing too big. In our survey of 31 colleges very few indicate that they have specific goals of enrollment growth for the next decade. Yet we can be quite certain that enrollments will go up for reasons to which we shall turn shortly.[10]

It even used to be fashionable to set forth specific enrollment *optima* suggesting that there might exist natural points of indivisibility or of full exploitation of capacity. Thus, from time to time, we have been told that either 800 students, or 1,000, or 1,500, or 1,800 would constitute natural enrollment ceilings.[11]

We have been always slightly suspicious of such rules of thumb. Naturally, we are aware of the fact that there is an optimum enrollment somewhere for any given institution. It makes a great deal of difference, however, how this optimum is calculated. Or more precisely, how it is *determined*, because experience would suggest that enrollment ceilings are seldom *calculated*.

During recent years, no doubt because of rapidly escalating cost and overall college enrollment pressures, much has been made of the need to use plant fully. In connection with this concern classroom space and other plant constraints would be the determinants of enrollment ceilings. Federal policy strongly favors this approach today in assigning certain Federal monies. Also, much has been made during the decade of the need for larger private college enrollments as a means of reducing the pressures on public systems of higher education. Once more State and Federal grantsmanship was structured accordingly. We have even seen academic calendar reform for the sole purpose of squeezing more students through the diploma mill by taking full advantage or real or apparent economies. However well intentioned these efforts have been, and however beneficial financially, we strongly suspect that the cart has been put in front of the horse, and we believe that our data suggest in part why we suspect so.

Before we return to the findings, the reader is entitled to know how we feel about enrollment policy. First, we think that—ideally speaking—size of enrollment must be a function of a well formulated and articulated educational philosophy. Second, we think that this philosophy must bear some relation to learning and t eaching effectiveness. Third, we are aware that each private institution is partly the captive of its own past. Enrollment policy in the here and now is thus quite well circumscribed by physical, political, and received philosophical constraints. What matters, then, is where one does go from there, which returns us to our first point in this paragraph. The colleges in our sample testify to the fact that answers will differ and that there is merit in the courage of one's convictions.

But there is also danger in public (and private foundation) policy which forces changes in conviction by means of lush monetary temptation. We should think that public policy vis-a-vis private higher education, particularly the type of college represented by our sample, should be so designed as to allow each institution to remain true to its very own, very personal calling. Appropriate motivation—even of

[10] Seventeen colleges in our sample responded that they anticipate *no* enrollment growth between now and 1975; only 6 schools appeared to have made well thought-out estimates of future student populations.

[11] Seymour E. Harris, *Higher Education: Resources and Finance*, McGraw-Hill Book Company, Inc., 1962.

a financial kind—is most useful, but not when it leads to the betrayal of one's deeply felt philosophy of education. When private colleges are faced with financial crisis, the responsibility is with those who offer aid not to compel individual institutions onto paths they would not choose if the funds were available free of enticing or restrictive conditions.

The most significant finding in this study centers on the effects on FTES costs of varying rates of enrollment growth. The data suggest—subject to further testing—that there may be a distinct advantage in enrollment growth. In several long range planning schemes with which we have worked there has been concrete evidence of this advantage. Other things being equal, the higher the rate of enrollment growth, the smaller seems to be the marginal addition to FTES cost. This fact has important implications for long range tuition prospects. On balance one would suspect that the higher enrollment growth institutions—other things being equal—will experience a flatter tuition inflation than the colleges with lower enrollment growth rates.

What we are saying in fact is that it appears as if the colleges with the higher enrollment growth rates *do indeed pass on to the student* (or to those who subsidize the student) *a substantially smaller percentage of the marginal total cost than the colleges with slower enrollment growth.* Our sample does not provide us with an "other things being equal" situation. Therefore, the summary in Table 1.A. does not reveal fully the significance of what we suspect. We intend to test this hypothesis further, but in the meantime we should like to derive some conclusions on the assumption that we are reasonably correct.

The key to this apparent fact of economic life in institutions of higher learning lies with the proportionalities which are inherent in the typical college cost structure. In the Instructional account which, as we saw, occupies about 50 percent of the Educational and General expense, there exists a relatively low and fixed relationship between FTES units and the pertinent cost units, i.e., the faculty. Traditional ratios for our sample range anywhere from 9:1 to over 15:1, and the effect is a relatively full passing on of total marginal costs to the student.

In contrast, the Administrative and Operations and Maintenance cost components experience more favorable indivisibilities vis-a-vis the *FTE* student. In the Administrative account the student-to-administrative-personnel ratio is on balance more favorable from the point of view of dividing total cost increases into FTES costs. Furthermore, the salary component is structured differently and of a lower weight compared to non-salary costs than is the case in the Instructional account. If we disregard the addition of new plant, the Operations and Maintenance component offers classical opportunities for declining unit costs as enrollments increase within capacity limitatons. Here we are dealing with fixed cost component which produces a declining cost curve per FTES until new plant is added. To the extent to which colleges must increase their plant (and equipment), the unit cost reduction effect can only be realized by means of larger enrollments.

In all three major accounts, therefore, economies can be effected from the full utilization of given capacity to an increasing extent as we move from the Instructional, to the Administrative, and finally to the Operations and Maintenance account. As new indivisibilities are added the temptation exists for some degree of enrollment escalation in order to soften the FTES cost effect.

It is useful to distinguish between short run and long run limits on enrollment growth. In the short run we operate within given indivisibilities. In the long run we add new fixed inputs which entail their own respective enrollment effects based on full utilization of existing plus new capacity. It is this latter instance which leads us directly to our concern about appropriate public policy on behalf of private higher education.

If there is value in smallness, by whatever definition, enrollment growth cannot be encouraged indefinitely. But we do not wish to suggest that enrollment growth should be actively discouraged, either. Financial aid, we believe, should be appropriate to the financial problem faced by each college in its own right.

When the college with smaller enrollment growth must pass on to the student (or as FTES cost) the bulk of the total marginal cost, its tuition inflation is potentially steeper. It is therefore running more quickly into the problem of pricing itself out of its traditional market. We would argue that the school with stable enrollment may have a more serious financial need than the school with rapid enrollment growth, other things being equal.

One problem which all colleges seem to have in common is their perennial need to upgrade and enlarge their services. In some instances this may mean plant, in others—and more often we suspect—it will mean program improvement. We therefore would favor a program-centered rather than an enrollment-centered financial support program for private higher education.

2. The Student Aid Dimension

So far we have avoided bringing up the matter of Student Aid expense and have limited our discussion to the Educational and General account. The need for massive uncovered Student Aid subsidies modifies our preceding argument substantially.

Instead of a cost advantage resulting from the full exploitation of capacity (and assuming that the fundamental educational philosophy is in no way violated), the Student Aid dimension *will produce a significant cost disadvantage*, particularly for colleges with relatively more rapid enrollment growth. Thus the Student Aid effect illustrated in Table 3.C. and on Graphs 2A. and 2.B produces not only higher FTES costs than would prevail without the subsidy, but actually may have accelerated the FTES cost increases and with them private college tuition inflation. In so doing, the private college has acted as an agency collecting a transfer tax from rich students to be able to pay the Student Aid subsidy to the needy students. In a vicious circle the gap between private and public student charges has thus been widening with the major effect of creating a financial crisis for most private colleges in our sample.

There appears to be some light at the end of the tunnel, though. As we are accepting the principle whereby Student Aid is fundamentally seen as a social benefit, we are developing social Student Aid programs. These have significantly eased the financial burdens in those States which to date have enacted appropriate legislation. A major problem, however, is the emphasis which most of the legislation puts on keeping the subsidies within the State. There are some notable exceptions, but the overwhelming long range effect may well be a concentration of enrollments for each college from within its own state, thus calling into question our interstate character of private higher education. Therefore, we see a need for a Student Aid subsidy program which counteracts and supplements the various State efforts with the ultimate aim of freeing the private college entirely from having to make up any unfunded or uncovered Student Aid subsidy. Over the long pull such a general approach—which the G.I. Bill of Rights fulfilled admirably—would bring a fundamental balance into the financing of the operations of private institutions of higher education.

Sources of Economies of Scale in Universities

Ferdinand K. Levy*

INTRODUCTION

This paper outlines approaches to realizing various economies of scale in the growth of institutions of higher education. We begin with a discussion of the difficulties in applying economic concepts to the operations of a university. After deciding upon useful measures of cost and output for our analysis, we next define economy of scale in terms of these and proceed to demonstrate where they may exist in higher education. For our purposes, it is convenient to divide the operations of a university into six parts: teaching, research, administration, acquisition of funds, physical facilities, and internal services. The paper concludes with some implications of the analysis for the design and efficient growth of colleges.

ECONOMIC CONCEPTS APPLIED TO UNIVERSITIES

Economists have traditionally been concerned with describing and prescribing the behavior of profit oriented firms and governments and until recently have paid little attention to non-profit directed entities such as charitable, religious, educational, medical, and philanthropic organizations. Two major reasons may account for this. First, until the end of World War II, these organizations really were not that important in an economic sense in the United States economy. That is, they had no significant effect upon the allocation of resources within the economy. Perhaps not a good excuse but equally as important as the first reason is the fact that the typical analysis of firms found in conventional economics was difficult, if not impossible, to apply to non-profit entities.

Obviously the phenomenal growth of non-profits in the last ten years[1] negates the first reason, and many good studies and summaries[2] of these institutions are finding their way into the literature of economics. More importantly, economists have begun to apply quite successfully the traditional economic tools of marginal analysis to hospitals[3] and universities[4], and thus economics is proving itself flexible enough to encompass all types of concerns.

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* The author is Professor of Economics, Rice University. This research was supported in part by the National Science Foundation Grant GU–1153 to Rice University.

[1] A good guide to this growth of non-profits and their import on the American economy is found in Ginzburg, E., D. Heistand and B. Reubens, *The Pluralistic Economy*, New York: McGraw-Hill Book Company, Inc., 1966.

[2] An excellent example of the current state of general economic research on education is Blaug, M., Ed., *Economics of Education*, Middlesex: Penguin Books, 1968.

The major difficulty in applying the economy of scale[5] concept to higher education is measuring the outputs of those institutions. First, with regard to numbers of students emerging from colleges, we note that there are differences in the types of education they receive. For example, there may be large economies of scale in producing teachers of English but not as many in producing physicians or engineers or large economies of scale in undergraduate education, but not in graduate training.

A second obvious difficulty is measuring the research output of universities. Here the problem is almost insurmountable, as the number of research reports published by a college is not necessarily indicative of their value or worth. In more economic terms, it is nigh impossible to combine research reports into a meaningful single measure or index.

If a conventional firm has a diversity of outputs, we usually aggregate these in "value added" terms.[6] This aggregation is also impossible to assimilate into the analysis of a university. To see this, consider an engineering student who will make an average salary of $20,000 per year for twenty years upon graduation. If he had not gone to college, he might have made an average salary of $15,000 for those twenty years. Thus the total value added for this student is the discounted present value of $5,000 per year for the next twenty years. The rate of value added is this discounted present value divided by the cost of educating this particular engineering student. Conceptually then, it is simple to measure the rate of value added on student output. In practice though, ignorance of the comparative salaries over the working lifetime of the student coupled with not knowing the appropriate discount rate to employ make such calculations meaningless.

It should be equally obvious that trying to apply value added measures to research in terms of increases in worth of knowledge or productive potential of the economy leads to the same problems of measurement. Thus, we are left attempting to identify economies of scale in the higher education process without any meaningful method of measuring its output.

We circumvent this problem here in two ways. In reference to research output, we shall make no distinctions regarding quality. That is, we shall speak of research output in terms of numbers of papers and not in terms, except in one or two instances, of their significance. When we speak of economies of scale in student output, we shall be specific and talk about numbers of students either in general or with reference to one type of student, e.g., graduate or undergraduate engineering or medical, etc. Nevertheless, putting the scope of this measurement problem outside this paper by no means eliminates the urgent need for looking into it.[7]

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[3] See, for example, Davis, K., *An Economic Theory of Behavior in Non-Profit Private Hospitals,* Unpublished Doctoral Dissertation, Rice University, 1969.

[4] Levy, F. K., "Economic Analysis of Non-Profit Institutions—The Case of the Private University," *Public Choice,* Spring, 1968.

[5] Economists generally define an economy of scale in a long run sense to be a greater than proportionate increase in the rate of output given a proportional increase in *all* inputs. This may arise from increased specialization of the factors and hence increased efficiency or perhaps from a reduction in waste. These economies cannot exist over all ranges of production, for at some point the diseconomies of controlling and coordinating the larger production process outweigh the economies of specialization.

[6] To understand the "value added" concept, consider a firm producing two products A and B. Suppose A sells for $10 per unit and B for $100 per unit. If the firm can produce two A's and one B from $100 worth of input, its total value added is $20, that is, 2 × $10 for A plus 1 × $100 for B minus $100. Equivalently, its rate of value added is $.20 for each dollar of input.

THE TEACHING FUNCTION

Instructional expense generally comprises more than sixty percent of most colleges' budgets.[8] Obviously any reduction in teaching cost per student should effect significant economies of scale. For our analysis in this section, we shall regard all students as homogeneous and consider output as the number of students graduated per year.[9] As student bodies enlarge, economies of scale in teaching may arise from any of the following three sources:

(1) Increases in the student-teacher ratio.
(2) Increases in the number of students enrolled in any one program.
(3) Increases in a college's potential to use mass teaching devices.

We examine these sequentially.

If the number of students in a university can increase without causing a proportionate increase in the institution's teaching staff, a significant economy of scale will arise. The problem here, of course, is that often there is a tendency to equate low student-faculty ratios with high quality education. The existence of this relationship is open to serious doubts. In fact, Herbert Simon, a member of the current President's Science Advisory Council has succinctly summarized them in the following passage:

> *There is no evidence that small classes provide a superior learning environment.* I have already pointed out the budgetary importance of the class-size issue. Theoretically, one can point to the greater opportunities for providing feedback in the small class. One can also point, per contra, to its encouraging the student to depend on knowledge of results provided by the teacher.
>
> Further, counterposing small class against large class does not really define a sharp issue in learning design: What goes on in the small class? in the large class? Above all, what is the student *doing*: what is he attending to, thinking of? When we have designed classroom processes carefully enough so that we can answer questions like these, it will be time enough to reintroduce class size as a variable.[10]

Increased grading requirements, availability of facilities for large classes, and counseling time by individual instructors will obviously cause some rises in expense as the size of the student body is enlarged.

What is important here, though, is that at present there is hardly any evidence pro or con which points out that the quality of education diminishes as the size of individual classes increases. Quite to the contrary is the idea that enlarging them might make the more distinguished professors available to a larger group of students and give the students a wider variety of teachers, both of which should enhance their education.

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[7] Cf. Denison, E., *The Sources of Economic Growth in the United States and the Alternatives Before Us*, New York: Committee for Economic Development, Supplementary Paper No. 13, 1962, for an aggregate measure of the worth of education in general for enhancing the growth of the U.S. Economy.

[8] Mushkin, S. (Ed.), *Economics of Higher Education*, Washington: Government Printing Office, 1962.

[9] Of course, some students will never graduate. Our implicit assumption is that the rate of attrition is invariant with the rate of students entering college.

[10] Simon, H. A., "The Job of a College President", *The Educational Record*, Winter, 1967, p. 75.

The best way to see the second point above, namely increases in the number of students enrolled in any one program is through an example. At present in Houston, there are two state supported law schools within five hundred yards of each other and two medical schools within five hundred feet of one another. Aside from the obvious economies of combining the student bodies in each and having larger classes and eliminating one set of laboratory or library facilities,[11] there is another more subtle economy to be realized.

Much faculty time is devoted to devising distinctive programs of instruction or curricula in any given field of study. At present, there is hardly any standardization in curricula for any given type of education.[12] Enlarging the number of students in any one course either by growth in student bodies or combining student bodies from separate adjacent colleges would tend to decrease the cost per student of providing his course of study.[13] There are obviously more significant economies in doing this in fast changing fields, such as engineering, science, business, etc. than in the more slowly changing ones found in the liberal arts.

Many colleges currently take advantage of new technologies in teaching. Taped or televised lectures and so-called automatic teaching machines are the most prominent of these. The ideas that all of these various devices have in common are the teacher's presence (before every student) is not required and the student is able to learn at his own pace. These methods make two large economies available. First they reduce the teacher-student ratio but perhaps more important, they force the instructors who compose the programs for them to spend more time studying the learning process, per se, and thus they may serve to enhance the students' education through improved teaching.

The problem, naturally, is that there needs to be a heavy fixed investment in both hardware and software, i.e., preparing programs and tapes, by a university which wishes to take advantage of this new technology. As the number of students enrolled in any course or program increases, the cost per student of preparing software decreases. Whether it is economical to use the devices depends upon a comparison of costs of these versus the cost of the conventional classes. The relevant parameters in the comparison would seem to be the number of students and as before, the rapidity with which the field being programmed changes.

RESEARCH

It is convenient for our analysis to define research output as additions to knowledge evidenced by publication of results of investigations. The principal costs associated with research consist of the faculty researcher's time, his assistants' time, and the need for facilities, either library, laboratory, or field. When we consider economies of scale in research, we refer to increases in its output without corresponding proportionate increases in cost.

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[11] Cf. below.

[12] Professional societies or accrediting bodies usually give minimum requirements, but hardly ever spell out the details of more than thirty percent of a program's curriculum.

[13] For a good summary of a "program" as an economic factor of production, see Simon, H. A., "Programs as Factors of Production", *California Management Review*, 1967.

First, regard research in a field as solving problems of a particular type.[14] The literature in group problem solving would suggest that as the number of persons working on the problem increases, the probability that a satisfactory solution will be reached increases at an even faster rate.[15] It would seem reasonable to suppose that as faculty and student bodies grow at a college, both the amount and quality of research output should also rise. More pertinent perhaps is the idea that as the number of faculty in a particular academic department increases, the diversity of points of view brought to bear on a given problem should significantly alter the probability of obtaining a solution to it.[16]

It should be apparent that specialized equipment which is used at less than capacity in research would be available to added faculty caused by the growth of a university. The same thought also applies to libraries.

The mass teaching devices referred to above would also serve to enhance the quality and quantity of research output. Basic courses or principles in any given field taught using these would free professorial time for research. Further, as these methods are usually designed so that students can learn at their individual speeds, they should also give students more time to enjoy activity with faculty in research and thus add to the supply of research assistants. This, of course, is equally as true at the undergraduate level as at the graduate.

ADMINISTRATION

There are several economies of scale to be realized in specialization of administrative functions. The most obvious of these is in establishing a group to help professors write research and grant proposals. At present, a great amount of faculty time is consumed in preparing grant applications; as faculty size grows, it becomes enonomical for colleges to help them in this endeavor and free their time for additional research or teaching.[17]

On a more general level, larger universities can support both internal administrators, i.e., those who handle academic policy, students, faculty, and the internal finances of the college, and external executives, those who are concerned with the relationship of the university with its environment particularly in fund raising and community assistance. The smaller university's executives must be able to deal with all facets of the institution's operations and thus could not have the expertise in any one phase that a specialist possesses. Further, most colleges, whether privately or publicly supported, have ruling boards of regents or trustees. Combining smaller schools into larger, more specialized ones would eliminate some of the less interested or less capable members of the boards.

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[14] "Problem" here means one in which there either is no single answer, as contrasted to an arithmetic problem in which there is only one right answer, or there is no certainty that the results obtained are correct.

[15] For example, see paper by R. Bales in Macoby, E. et al., ***Readings in Social Psychology,*** New York: McGraw-Hill Book Company, Inc., 1961.

[16] The argument between parallel and collective research found in the Department of Defense is whether two competing groups of three persons each can solve a problem better than a single group of six. The question here is whether six people can solve either proportionately more problems or a single problem better than three persons.

[17] Some universities, e.g., Stanford, MIT, which have large external support, find it advantageous to have an administrative staff member in Washington to expedite proposals and to keep the faculty informed on sources of funds.

Since the advent of electronic data processing, the internal accounting procedures' cost does not grow commensurately with the size of any institution. Larger schools using this equipment can effect significant cost savings on a per student basis. The same conclusion holds for service personnel, purchasing, and inventory control procedures. As before then, increased size enables a college to take advantage of personnel specialization and the newer mass data handling equipment.

ACQUISITION OF FUNDS

At present, similar schools in an area, whether state supported or private, compete for external funds from state legislatures and the general public. Most states have set up coordinating boards to control the allocation of public monies into higher education. Yet the political process with its geographically chosen representatives practically assure that there will be costly duplication of facilities and programs.[18]

Most private schools are finding it necessary both to conduct periodic capital campaigns and more importantly to secure funds to meet current budget requirements. As these institutions grow and as rising tuition and income from endowments lag behind costs, these general fund drives should become even more frequent.

The huge waste in fund raising that could be overcome by specialization of schools is the competition in fund raising. Rather than have, for example, three state supported engineering schools compete for state funds, it would seem more sensible to have a single engineering school with the economies of scale alluded to above as a single recipient of these funds. Further, rather than have four or five private schools in an area [19] set up administrative organizations to collect external funds, it would be more economical to follow the lead of the United Funds or the United Negro College Fund and aggregately conduct drives for support. There might be reasons for individual alumni fund drives, but there would seem to be hardly any excuses for soliciting the general public and large corporations on any other than a collective basis. The major fault of solicitation on an individual basis is that it gives the huge donors, as for example, the large foundations, a major role in determining which colleges will flourish and which will wither, a decision which is better left to students, faculty, and trustees.

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[18] There is presently a move in Texas to establish teaching hospital facilities and a medical school in Lubbock, home of both Texas Technological College and the State's present governor, Preston Smith. Perhaps Texas needs more medical schools, but I am quite confident that enlarging the already existing ones would be a more economical method of providing them rather than adding new ones.

[19] Or of the same religious denomination.

PHYSICAL FACILITIES

It has been estimated that during the academic year classroom and laboratory facilities are used at less than forty percent of capacity.[20] There are a variety of reasons which may account for this:

(1) Some facilities, e.g., laboratories, may be quite specialized.

(2) Inflexibilities or rigidities in the way classes are scheduled, e.g., no labs at night, no eight o'clock classes for particular faculty, etc.

(3) The diversity of different size classes requiring some large lecture rooms, some seminar rooms, etc.

It should be apparent from the foregoing that growth in the physical facilities of a university does not have to be as fast as the rate of increase in the student body. Moreover, what is needed is some change in the inflexibilities regarding their use. The idea of a 7:30 AM to 5:30 PM day for facilities can easily be changed; after all, large city universities use their facilities for students who are employed during the day. Some complete study is needed of the trimester system, where the facilities of a university could be more fully utilized during the summer months.

There is at present a study[21] underway to design so-called flexible classrooms which by use of partitions can be changed from large lecture rooms to small seminars. Preliminary results[22] from the study show that this new flexible construction costs only five percent more than conventional buildings.

There would seem to be little economies of scale in housing students. The exception, of course, is to use the facilities for a complete year rather than only nine months. Smaller dormitory units seem to be preferred by students, especially at large universities, as a means of furthering interpersonal relationships with other students.

INTERNAL SERVICES

For our purposes, internal services are classified as libraries, computer centers, intramural programs, etc. The largest part of the cost of these is borne by the first two. As stated above, libraries are subject to increasing returns to scale, and as is well known, modern information retrieval technology has helped to prove that a few large central depository libraries are more efficient and economical than a scattering of smaller libraries in a region.

Larger universities are able to justify the faster larger computers. As has been well documented,[23] the large computers, even though bearing a heavy rental or purchase price, have a lower cost per calculation than smaller scale ones. Moreover, the large computer is more flexible in the types of calculations that it can perform and the types of instruction that it can be used to assist in.

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[20] Mushkin, S., *op. cit.* The figure refers to room and not seat capacity.

[21] "Feasibility Study Report: A Building System for Academic Buildings for Indiana University and the University of California", Building Systems Development, Inc., May, 1967.

[22] *Ibid.*, pp. 47 *et seq.*

[23] Sprowls, C., *Computers—A Programming Problem Approach*, New York: Harper and Row, 1966.

SOME IMPLICATIONS

This is a background paper designed to show where economies of scale may exist in institutions of higher education. It suffers from lack of both a complete economic analysis of each of the potential economies discussed and data. An obvious implication thus is a need to collect data to see actual costs of large versus small colleges.

If the ideas set forth in the paper are correct, the following policies for planning the growth of higher education in the United States would seem appropriate:

1. Single rather than multiple professional schools in an area. By professional school, we mean law, medicine, engineering, business, dental, social work, etc. Having more than one of these schools in a particular region involves expensive duplication of facilities, libraries, etc. in addition to furthering competition for funds, faculty, and students. It would seem reasonable to suppose that providing travel expense to students from their home to a distant school in the region would be cheaper than a provision for multiple professional schools in the area. In addition, by having larger units of these types of schools, the research output should increase and be of higher quality. The only type of multiple schools for a state or region would appear to be the two or four year liberal arts college.
2. A complete investigation of the learning process with emphasis on class size. Do smaller classes enhance the learning process? Do larger classes "depersonalize" a student's education and detract from his learning process? At present, there is hardly any evidence on these points, but as shown above there are significant economies in large classes. What is needed now it to find out whether the diseconomies of them in the learning process outweigh the economies.
3. The establishment of large central libraries and computer centers connected via telephone lines to the colleges in a geographical area.

The adoption of the above ideas would not only make the educational cost per student lower, but should also serve to help granting agencies fund research proposals with less arbitrariness and more efficiency.

PART IV

THE STRUCTURAL OUTLOOK FOR INSTITUTIONS OF HIGHER LEARNING

The Changing Structure of American Institutions of Higher Education

*Ralph W. Tyler**

BACKGROUND

Most changes that have taken place in American institutions of higher education have been responses to changes in the larger society and can be more adequately understood against this background. Until the Second World War the effects of science and technology on the economy and particularly on the composition of the labor force were in limited sectors and resulted in gradual adjustments. The colonial colleges and universities made few modifications of the institutions adapted from England that prepared their students for the occupational, social and political elite. The students were largely drawn from the upper-middle and upper classes of American society although a few young men from lower social and educational backgrounds were able to gain enrolment and help to provide a reasonable degree of social mobility in the society. As the country began to develop industry, commercial farming and transportation systems the need was felt for a marked increase in the numbers of those prepared for leadership and technical roles in these fields and for the service professions that grew with industrial expansion, namely, law and medicine.

The existing colleges were largely unresponsive to the requests from the growing agriculture and mechanical classes to enrol their children and to give attention to the substance of their needs. The common reply to these pressures was, "Your young people are not college material. They don't even have a command of Latin and Greek. Furthermore, science, engineering and agriculture are vocational subjects unfit for college study."

The upshot of this conflict was the passage by the Congress in 1862 of the Morrill Act, which offered Federal land to every state that would establish a college "to serve the agricultural and mechanical classes." Thus the Land Grant Colleges were founded, not through internal reform but by the use of Federal inducements.

Since the turn of the century the applications of science and technology to agriculture, industry, business, national defense and the health services have been changing the composition of the U.S. labor force profoundly. In 1900, 38 percent of the labor force was engaged in agriculture, now less than 7 percent. Another 23 percent was engaged in non-farm unskilled labor, now only 5 percent. As this century began, about 60 percent of the U.S. labor force had had little or no education or training. Now, less than 10 percent of the jobs available are filled by those with little or no education or training. Education has become a necessity for almost everyone if he is to participate constructively in the American economy.

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While technology has brought about great reductions in the demand for unskilled labor, the occupations in which there is the greatest increase in demand are those which require post-high school education, namely, in the health services, educational services, recreation services, social services, science, engineering, accounting and administration. In a century, our economy has made overwhelming shifts. In 1860, 80 percent of the U.S. labor force was engaged in producing and distributing material goods and only 20 percent in providing for our nonmaterial demands. In 1960, 45 percent of the labor force was engaged in producing and distributing material goods and 55 percent was furnishing nonmaterial services. Last year the figures were 40 percent and 60 percent. The United States is the first nation to have developed technology to a point that less than half of its labor force is required to furnish material goods, thus freeing a majority of its members to meet the demands for health, education, recreation and welfare.

These changes in the larger society have been reflected in the increased enrollments in colleges and universities. At the turn of the century, 3 percent of the age group entered college; now it is 40 percent. This tremendous expansion is due to the interaction of several factors, namely, the labor force demand for college graduates, the rising aspirations of the American people as they see the opportunities available for them and their children that are contingent on college education, and the response of public and private sources for greatly enlarged support. But, the ideology of many college professors and administrators still reflects an earlier condition and the result is both inadequacy in fulfilling the changing mission of the American college and the development of conflict among those who have special interests.

CONFLICTING VIEWS AND FORCES

In a society in which most people are unskilled laborers, only a few are needed for the occupational, social and political elite. Schools and colleges then are largely sorting and selecting agents rather than educational. If there are places for only a few people at the top, colleges concentrate major efforts on identifying those few, enrolling them, arranging continuing competition to select the winners among those few and finally certifying, with appropriate degrees, those who have been able to survive this sorting procedure. Emphasis is given to "admission standards," that is, to admitting only those already able to manipulate the system and get good grades. Correspondingly, the system continues to fail out those whose grades are lower and to consider the college an excellent one if only a few survive. Tests and examinations are employed to sort people for courses, curricular programs, admission to graduate school and the like. The examinations are designed to measure individual differences, that is, to sort out individual students so as to place them in the top group, next higher group and so on down to those who are "failures" and will eventually be dismissed. The tests are not designed or used to appraise individual or group progress in learning.

Our society, however, has developed opportunities for many people to be employed in technical, professional, managerial and service occupations. The functions of colleges have been shifted from primarily sorting and selecting only a few to identifying potential talents of many sorts and furnishing opportunities for these talents to be actualized through education. Research on the brain and in behavioral genetics indicates that the learning requirements in our schools and colleges place no strain on the basic potential of the vast majority of human beings. Colleges would not be attempting an impossible task if they sought to help all students learn rather than to serve primarily as a screening and sorting institution. But to perform such a function effectively requires a different orientation of the college faculty. The prestige that colleges now derive from admitting only the top group of high school graduates and from failing out a substantial proportion of them will have to be replaced by pride in helping students to learn. This change in orientation is likely to take place only where external pressures are strong enough to require response and readjustment.

This readjustment will also require new training or retraining of college teachers. At present, most college teaching has little impact on student learning. The college teacher lectures, but does not show the student what he can learn, why he should learn it, and how he can learn.

This is in great contrast to the learning of sports, the use of apprentice or intern experience in occupational education, or the informal learning that most people carry on. What students now learn that is relevant to the college curriculum comes through their ability to use books and other published materials, their use of other students and of adults, their observations and their other out-of-class experience. Hence, students who come from backgrounds where family or friends are actively learning are more likely to learn that which the college is set up to teach than students from other backgrounds. Few college teachers help the students to learn who come from backgrounds where no one has been to college and the learning of abstract principles and concepts is rare. It is possible for teachers to aid such students to learn, but this generally requires the use of procedures not now commonly used or known by college faculty members.

A second ideological conflict now current is over the functions of teaching versus research in higher education institutions. For more than 250 years after the founding of the first American college there was no conflict on this issue because colleges were not engaged in research. The Ph. D. program of German universities attracted American scholars to study in Germany during the latter half of the 19th century. Then, in 1891, three universities were founded that gave major emphasis to research, Clark University, Johns Hopkins and the University of Chicago. Graduate programs and "research productivity" of the faculties became increasingly popular after the First World War and have probably reached the peak of prestige at this time. The recent emphasis is partly due to the recognition of the extent of dependence of the U.S. economy and national security upon new knowledge attained through research, to which both public and private agencies have been generous supporters.

The "folklore" of the scientific and scholarly community denies the conflict between research and teaching. It alleges that an active researcher is a better teacher than one not engaged in research and that one's research is carried on with the aid of students who learn in the process of their work. It is also claimed that good faculty members can be attracted to colleges and universities only if there are excellent opportunities for them to carry on research.

No valid evidence has been submitted nor has any been obtained to support these views. We do know that many institutions in which much research goes on provide teaching contact with "good researchers" for a very small proportion of the undergraduate students, and the teaching assistants who are responsible for most of the direct contacts between the faculty and freshmen and sophomores are not only inexperienced but are giving major thought to their own graduate work rather than to the educational needs of their students.

The argument about what students learn from participation in the research programs of their professors applies primarily to graduate students who are preparing for research careers and not to the undergraduates who most need guidance in learning. Finally, the last claim that good faculty members are attracted only to places with heavy support of research assumes the truth of the questionable proposition that most good faculty members are researchers. Faculty members who have an interest in teaching are not seeking to devote major attention to research.

The conflict between the research and teaching functions will not be resolved until these current assumptions are changed on the basis of the evidence accumulating in regard to them and new policies are adopted. In the formulation of new policies recognition must be given to the different and special conditions required for effective teaching on the one hand and productive research on the other.

The present dominant view holds that teaching requires only competent scholars to present to students some of the things they know and research requires only time, facilities and assistants to be provided for every college professor. This is a grossly inadequate notion. Good teaching is stimulating and guiding the learning of students. For teaching to be effective, students must be actively engaged in the quest for understanding and in seeking to develop the abilities and skills characteristics of an educated person. To get students actively engaged in learning often requires the teacher to demonstrate the significance of what he is teaching and to work with students step by step as they attempt to gain understanding and to develop their abilities. The good teacher needs to know a great deal about his students and to plan his teaching so that the students can see for themselves the significance of what they are learning and doing and can gain increasing confidence and skill in study as they master each phase of the subject. Hence, to be a good teacher is a major and difficult task for a college professor since it requires much more than simply telling students some of the things he knows. It takes time and concentration of attention.

Research also demands special efforts. Research that contributes new knowledge requires the scholar to be thoroughly familiar with the present state of knowledge in his subject, including the puzzling gaps in current understanding. He must also be master of the tools of specialized research in his field so that he can critically scrutinize the growing edge of knowledge and obtain data needed to validate or to reject ideas that appear to furnish explanations for previously unexplained matters or to fill in parts of the knowledge gaps. The teacher's tasks are sufficiently different from the tasks of the research scholar that it is difficult to carry on both at the same time. It is even uncommon to find one person who is deeply interested in doing both kinds of tasks. Hence, the prevailing expectation that every professor should be both a good teacher and a good research scholar largely results in ineffectiveness in both roles. As a result, most students are poorly guided in their learning efforts, and relatively few faculty members contribute significantly to the development of knowledge. The pressures that are building up from student groups and interests outside the colleges and universities appear likely to clarify this issue and in many institutions to shift policies and practices.

In our changing society, the forces that largely control an institution of higher education are in dynamic equilibrium, that is, the balance of influences at any given moment can be expected to shift over time as new interests gain power or older forces lose or gain in total influence in the changing environment in which they operate. Prior to 1947, the demand for college faculty members in relation to the supply was in equilibrium with salaries somewhat lower than those paid to persons with similar levels of education outside academia. The division of responsibility for policy making among trustees, administrators and faculty members typically gave the faculty major responsibility for curriculum and instruction, partial responsibility for admissions policies, student affairs and discipline. In most institutions decisions regarding establishment of programs, new schools, salaries and teaching loads were made by the trustees on recommendation of the President.

Since 1947, the great increase in numbers of students and in funds for research have created unprecedented demand for faculty members. The equilibrium has shifted. In general, salaries are higher, teaching loads are lighter, faculty members have assumed major responsibility for policies regarding research, teaching and have much greater influence than earlier on the establishment of new programs and schools, and the conduct of students. But this situation will change. The unprecedented numbers of students in graduate schools are beginning to swell the ranks of prospective faculty members. In ten years, the equilibrium of supply and demand for college faculty will result in a relatively lower salary position compared to the non-academic sector than at present.

A second factor that is changing the equilibrium of control in higher institutions is the pressure of student protests. At least three types of student activists are now identified. There are the "Black Organizations" and other minority groups who press for more of the educational advantages that have been obtained by the visible majority. At present they are unclear about the steps required to get a good education, but they know that present college programs in general are not giving them the advantages thought to derive from college experience. They are being failed out in large percentages, which they blame on having to take hard courses and to be graded by an unfair marking system. So they ask for "Black Departments," and largely elective curricula. It is likely that they will discover after a while that the root of their problem is an educational program and a faculty not designed for students who come from backgrounds of limited education. Then they will press for the faculty to give major attention to their education and learning.

It is likely that the changing attitudes of minority groups will involve several steps. One will be the gradual but increasing acceptance of the position stated by some successful negroes like Sir Arthur Lewis that higher education can best help members of minority groups by enabling them to acquire the competencies needed to participate at a high level in modern society. This view will develop as a considerable number of graduates from minority groups enter the labor market and other sectors of society and find that success is in great measure dependent on effective performance. Passing through a college and receiving a diploma will turn out to have only limited value if they have not also acquired the knowledge and skills needed to carry on the activities of the positions they seek. As they recognize the importance of learning what is needed for these positions, a second step will be taken, in which the curriculum will be closely scrutinized to find out whether the college is attempting to teach the necessary competencies. This will reveal gaps due to the fact that many white middle class students have acquired some of this knowledge and certain of the skills before they entered college so that the present curriculum has made no provision for their learning. Organized minority groups will then press for curriculum changes to meet their needs. A third step in the changing attitudes will be the increasing recognition of the inadequacy of most college teachers in stimulating and guiding the learning of students from minority groups, partly because they do not know and appreciate the background of these students both in academic development and in attitudes and motivation. At the same time, some of these students will have encountered programs and faculty members that are successful in helping them to learn the things required for success in higher levels of society. As it becomes more widely known that most minority students have great difficulty in achieving their aspirations while some find college situations that are clearly helpful, the leaders are likely to recognize that the root of their problem lies in the educational system which has not been designed for students who come from backgrounds very different from the typical middle class Americans.

A second protest group of students are those who largely come from middle class backgrounds and want to be involved in learning that is relevant to their own plans and aspirations. They seek education that gives them new and grander visions, new and more fundamental understanding, and intellectual and social skills with which they can deal with life and the world. Instead, they find uninspired courses that seems to have no connection with life as they know it and as they hope it will be. They find teachers who seem unable to communicate with them and who are apparently uninterested in them. They seek wholesale educational reform. This pressure, as it builds up, is certain to influence faculty members in their attention to the curriculum, teaching and learning.

A third type of protest group are those who belong to or support the organization called "Students for a Democratic Society." They believe that contemporary American society is so hypocritical, so corrupt, so engrossed in material production, and in maintaining and conforming to rigid institutions that there is no hope for its reform. They are the present-day anarchists whose professed goal is to destroy colleges and universities in the hope that they can take leadership in rebuilding higher education. Their influence is likely to confuse pressures for genuine reform and to give some support to those who want no change.

However, the present trends seem clearly to indicate that students will be heard and will have a significant influence on policy making both through policy committees of faculty and administration on which they will be represented and through articulation in public and private of their views. Their influence, I believe, will bring about an increase in the effectiveness of colleges and universities.

Parents of the new groups of students now enrolled in higher education are becoming another pressure group that will, for a time, increasingly influence policy making in colleges and universities. A recent Gallup poll shows that 97 percent of the parents interviewed want their children to enter college. Parents who have not attended college view higher education as a major means to insure a bright future for their children. Hence, many of them are deeply concerned with the success of their sons and daughters in going through college and getting the appropriate credentials. Reports that are brought home about the neglect and indifference of the professors arouse parents to protest and to seek means of influencing the college. They are not likely to have a massive effect from direct confrontation with the faculty or administration of the college, but they are likely to cultivate two lines of influence. One is through the legislature in case their child is in a state college or university, and the other is through their effort to select a college that is reported to give "poor boys" a square deal. The latter force will be greatly accentuated if the proposal from the Carnegie Commission on Higher Education is adopted, which would provide funds for the student to use at the college or university of his choice. At present, the nearly monopolistic position of state colleges and universities reenforces the majority faculty ideology, since there is no great competition among colleges with different views about education. Whatever means become available, parents of students from lower income levels will increasingly be heard because they perceive education as the major avenue of advancement for their children. For the middle classes, education is less critical since the parents have access to a wider range of occupational opportunities. This explains why parents in the past have not played so large a role in college policy making.

The major employers of college graduates will continue to exercise a significant influence on policies in institutions of higher education through trustees, legislators and financial grants. Programs in engineering, business and nursing have frequently been adopted by colleges and universities due to the pressures of groups who employ graduates in these areas. When graduates in one of these fields are in short supply, representatives from employers' groups have found it helpful to their interests to contact the college administration and selected faculty members to devise new programs, to recruit new types of students, to adopt new qualifying standards, and the like. This process is likely to be accentuated in the future because of the rising demands in the service occupations that can be met only by recruiting from a much wider range of youth than have heretofore been enrolled. The new enrollees will require more attention by the faculty to the curriculum and to teaching and learning if the students are to be successful, and the college will be judged by the employers in terms of its success in providing competent persons in these fields. For this reason the influence of employer groups places emphasis upon effective education.

For the past ten years, some industries and chambers of commerce have sought to increase the amount of research conducted in the sciences in their regions because they believed that a concentration of scientific research activities attracted new industries. Recent experience does not support this belief, nor is it possible to raise the level of research activity substantially in a large number of places. Actually, the concentration of technical industries in such areas as Boston, the Bay Region of California, Los Angeles, and Rochester, New York is much less attributable to the research activities of the neighboring universities than it is the availability of technically trained personnel, that is, an effective educational system is more essential than a concentration of research activities. As this becomes understood, the pressure for general increases in research activities of colleges and universities will not be continued by industrial and civic organization in the region.

A major influence that will affect the structure and functioning of institutions of higher education during the next two decades is the allocation of financial resources. Not only the amount of funds made available, but their differential distribution to different institutions for different purposes and the conditions under which they are granted, will have far-reaching consequences. At the present time the money allocated to a publicly controlled college or university has been based largely on the number of students enrolled. Little or no attempt has been made to question the principle that increasing numbers of students require corresponding increases in annual operating funds. The support of research by the states has been obtained largely through internal allocations by the university of funds furnished on the basis of student enrollment. Research support by the Federal government has been based primarily on the number and quality of research proposals submitted to the funding agency and not on the basis of the effect on the college or the relevance of the research undertaken to the educational mission of the institution. In the privately controlled colleges and universities, funds are allocated to a major extent through a market mechanism in which students choose the institution and pay the fees, and donors choose the institution and pay for things that they value in the college. The larger private universities also obtain research funds from Federal agencies on the same basis as public institutions.

This method of allocating resources is changing. The continuing increase in enrollments, the rising costs of operation and the increasing criticism of the effectiveness of colleges and universities are stimulating re-examination of the system of allocation. Unquestioning acceptance of traditional policies and practices is slowly disappearing, and colleges and universities are increasingly being asked to justify requests by rough cost-benefit analyses of alternative proposals. This is revealing the confusion that has arisen from mixing research costs with teaching costs and from the failure to develop measures of benefit or of outcomes of teaching and research.

The experience of federally supported research projects has afforded a basis for study by various university groups and government accountants of the actual costs of research projects. Except for the difficulty of allocating accurately the time spent on the research project by a faculty member who devotes only part of his time to research, the bases that have recently been developed for calculating research costs are reasonably satisfactory. Several universities have also cooperated in seeking to calculate teaching and learning costs. This is more difficult than computing costs of research because of the larger number of resources used that are not clearly identifiable in terms of particular teaching and learning programs, such as, libraries, laboratories, public lectures, forums, plays, movies, counselors, assistants in laboratories and other learning centers, residence hall facilities and supervision. However, progress is being made to improve the accuracy of cost computations, but on the side of the resultant benefits, both comprehensive design of studies and the related techniques are in primitive stages of development.

In the research areas the relevance of the findings of the project, the identifiable contributions it has made both to the advancement of knowledge in its field and to our progress toward social goals, the soundness of the design of the investigation, and the quality of its execution are being explored as possible dimensions for measuring the benefits. In the educational arena, the present methods being used to measure output are still grossly unsatisfactory. Because student credit hours can be counted without collecting new kinds of data, some institutions are still using student credit hours of instruction in lieu of a measure of the teaching and learning output. This is patently a fallacy since the number of students who are awarded a given number of hours of credit for their work says nothing about how much or what they have learned. It varies with the size of classes and not with the amount or quality of learning. Some efforts have been made to assess benefit in terms of the percent of those students beginning a college year who complete the year in good standing. This is a crude measure of the success of the college in enabling students to move toward the completion of their educational programs but it does not take into account the extent and quality of their learning and is more likely to be related to the grading standards of the faculty. Current discussions are focusing on the use of comprehensive examinations, sample surveys of knowledge and skills, and investigations of the success of samples of graduates as promising measures of educational benefits. This ferment indicates an increasing demand for rational bases to justify resource allocation. It is likely to have powerful influence on the folklore of academic life, placing value on effectiveness and efficiency rather than on conspicuous expenditure.

THE EMERGING PATTERN

It is important to recognize that the patterns of higher education in this country will continue to be in flux even as our society is a dynamic, changing one. An effort to describe probable characteristics of colleges and universities in the next two decades is based on a projection of present active forces, several of which are in conflict, and to focus attention at a point ten years hence, when the changes now underway or incipient will have reached a further stage of evolution. What is predicted in the following section is based on an assessment of the outcome ten years hence of present movements. It is likely to err both in the estimates of the strength and rate of movement of present forces and also in being unaware of new forces that may become involved in higher education that are not now on the scene.

The characteristic which seems most clearly to be predictable for the future is the increase in the importance of the community and junior colleges. They now enroll more than 20% of all students in post-high school institutions, and at the rate these colleges are increasing in number as well as in enrollment, it is safe to predict that ten years from now 3,000,000 students will be enrolled in community and junior colleges, representing one-third of the total post-high school enrollment and approximately one-half of all first- and second-year students. Their importance is due to several factors. They are generally open-door colleges, enrolling nearly all high school graduates or adults who apply. Because the students represent a very wide range of background and previous educational experience, the faculty generally recognizes the need for students to be helped to learn. Hence, more attention is given in these colleges to the curriculum, the relevance of courses, the appropriateness of the textbooks and other reading materials and the use of audio-visual aids.

These institutions are recognized as serving the community in which they exist so that students, parents, employers and other leading citizens are able to present their points of view and interests to which the college seeks to respond. They differ from the traditional four-year colleges also in permitting wide variations in attendance patterns, including night classes, alternation of work and study by terms or even years, and part-time attendance while the student is employed in a full- or part-time job or is largely occupied with home responsibilities. Because these colleges generally recognize that they have special responsibilities that differ from those assumed by the traditional four-year colleges, the faculty is recruited in large numbers from high school teachers and persons with experience in industry, agriculture and service occupations. Hence, they are more in tune with student and community expectations. Furthermore, the per capita cost of education is usually much lower in the junior and community colleges than in other institutions of higher education.

The only forces now observable that might operate to reduce the growing importance of junior and community colleges are the attraction of the faculty to the conditions thought to prevail in the traditional four-year colleges and the prestige which some community members believe is attached to the presence of a four-year college in that community. Typically, teaching loads are lighter in four-year colleges, and the faculty members assume less responsibility for constructive contacts with students. From the vantage point of the junior college, a professor in a four-year college does little work and is free to write, to think, to lecture, and to play.

From a somewhat similar viewpoint, some community leaders see the establishment of a four-year college in their community as a symbol of status, having moved "beyond" preoccupation with the education of students for constructive lives in the community to education for elite positions and for leisure. These two forces produce a similar interest in changing the junior or community college into a four-year college or university. It appears unlikely that this interest will gain sufficient support to affect the present strong trend toward increased importance for the junior or community college.

A second feature that seems likely to emerge within ten years is the increased separation between the structures and functions assigned to undergraduate education, particularly the education of freshmen and sophomores, and research and graduate education. At present, colleges and universities oppose this separation because current operations depend heavily upon reciprocal relations between upper and lower divisions. In large universities, graduate students gain major support from serving as teaching assistants in undergraduate courses. Commonly, funds are obtained on the basis of total enrollment in which undergraduates, even freshmen and sophomores, yield amounts of support in excess of that spent on them, while research and graduate instruction consume the excess provided from the undergraduate allotments. Furthermore, large undergraduate enrollments justify large departments, which can thus support greater specialization of faculty members and a certain number of stars, who bring prestige to the institution. Finally, some institutions believe that large undergraduate enrollments are likely to support strong athletic programs.

The forces that seem likely to bring about greater separation of research and graduate instruction from undergraduate education include students and parents and demands from funding agencies for accounting by function and for greater efficiency. Student and parent pressures are strongly directed to the neglect of students by senior faculty members. The use of student assistants, the infrequent contact with "real professors" are two points that appear again and again in student complaints. When faculty members try to meet these protests by giving serious attention to the education of students, they find little time for research. Hence, those who view themselves primarily as scholars and scientists rather than as teachers are unhappy with the changed situation. Some accept offers to go to another institution, which promises more time for research. Others want to be appointed as "research professors" or to become members of research institutes which have no undergaduate teaching function. Some point to the system in the Soviet Union as a desirable example. In Russia research institutes are separate from the universities, thus clearly defining professional responsibilities.

Funding agencies are pressing for better accounting and more efficient university operations. Legislatures find it difficult to understand why the state university reports a per capita annual cost of the education of undergraduates as two to five times that of the junior colleges, when the investigations of later academic achievement show that junior college students of similar scholastic aptitude rating do as well in upper division work as do students who were in the university during their freshman and sophomore years. The apparent inefficiency of the university in its conduct of undergraduate education may not be wholly a matter of inappropriate accounting procedures. It is also probable that faculty members who are rewarded for their research and writing but at the same time are responsible for undergraduate courses are less likely to give thought and time to their undergaduate students than are junior college teachers whose chief responsibility is teaching.

A clearer separation would not only increase the likelihood that the faculty assigned to undergraduate education would give more attention to learning, teaching and the curriculum, but it would furnish a basis for a more objective and ethical assessment of research productivity. The folklore that every teacher should also be a researcher had a good influence when it was promulgated at the end of World War I in developing research interests and attitudes favorable to research in an otherwise pragmatic society. But as a means of training people for research or furnishing an efficient basis for obtaining new knowledge it has been grossly inefficient. Most persons when they receive the degree of Ph. D. require experience on the job to become effective researchers. This is not surprising. In medicine, law, engineering and business administration, for example, university education provides only one component of preparation for the profession. Experience on the job, preferably with skilled guidance, is necessary for the development of a competent professional. In similar fashion, every graduate student preparing for research will need research experience under skilled guidance, but this does not mean that every professor in graduate school needs to have his own research laboratory. Research institutes under university control, research laboratories and centers operated by public agencies or by private firms or non-profit organizations could serve as on-the-job training institutions. When funding agencies require objective, critical appraisal of a university's research program in terms of the efficiency of its research production and its training of research personnel, many readjustments are likely to be made that more clearly separate the responsibilities of undergraduate education from research and research training.

Even when it is recognized that the research enterprise can be more efficiently conducted when it is not confused with undergraduate education, concern will be expressed over the danger that the undergraduate teacher will be obsolete and no longer abreast of scholarship unless he is actively engaged in research. Disregarding the fact that evidence has not been obtained to indicate that those undergraduate teachers who do some research are more abreast of the significant developments in their field than those not so engaged, there are two courses of action that could reassure those who have this concern. In the first place, a college teacher might well follow the practice of some other professions, namely, to become a Fellow in a research center in the summers or in sabbatical years. This intensive experience is more likely to give the teacher a real sense of research participation than trying to do a research project while engaged in the demanding efforts of teaching. In the second place, funds could be made available for college teachers to conduct small-scale, inexpensive research projects designed to involve their students. Undergraduate research participation becomes a means of bringing students and teachers together and to enhance the interest of students.

On whatever lines the several engagements are fought, it appears very likely that higher education institutions in the next decade will show a much sharper separation in the structures and the functions of research and research training and undergraduate education, particularly for the first two years of college.

A third probable development will be the somewhat increased importance of institutions enrolling less than 2000 students and the relative decrease in the importance of the very large colleges and universities. This prediction is questionable since it is so counter to the trends of the past half-century. However, three kinds of forces seem to move in this direction.

The first is the unhappy feeling among faculty and administrators about the problems of communication, of "red tape" and the complexities of living in a very large university setting. Faculty members in large universities complain that there is no longer an academic community, they feel like strangers in a crowd. They complain of transportation problems getting to and from and around the institution. The parking difficulty is a symbol of this problem. Administrators are unhappy about the difficulty of building an esprit de corps among thousands of staff members. Communication lines fail or are nonexistent—the sense of the "university family" has been lost. Administrators also point out that the presumed economies of scale have been passed. Very large universities cost more per capita to operate than smaller ones. Pride in size seems now less important to administrators than greater effectiveness.

The second force is furnished by students and parents. Some of the intensity of student unrest and the dissatisfaction of parents is due to the feeling of students that they are anonymous in a very large university. They not only feel unknown by faculty and administration, but also helpless. In such a setting the sense of being neglected is likely to grow. In interviews parents frequently state that if there were a smaller place equally good and with similar tuition charges, they would much prefer to send their children there.

This leads to the third force that seems likely to operate, the provision of funds to students who, with the aid of their parents, can choose the college or university where these educational funds can be used. At present, public institutions with low tuition rates have a near monopoly on the education of students from low-income families. The consumer of the educational services has very limited choice within his income. The proposal of the Carnegie Commission, if adopted, would greatly change this picture. As in other sectors of the economy, consumer choice stimulates competition and is likely to encourage educational alternatives that would appeal to one or more kinds of students. The commonly-held belief that the student is given more attention in an institution that is not enormous in size would affect many student and parent choices. Hence, if this proposal is adopted, middle-sized institutions will be more popular.

In addition to these changes affecting the external structures, we can anticipate changes within. Because the curriculum appears to discriminate against students from working class backgrounds and to furnish educational opportunities only for the academically oriented, a wider range of electives and alternative programs will be offered as a response to student and parent pressures. A wider variety of oppotunities for occupational preparation will also be available because of the demands of employing groups as well as the pressure of students.

The grading system is under attack because students see it as a tool for dismissal and a means of coercion to follow the whims of the instructor. At present, pass-fail rather than the five-point grading scale is being adopted by a number of institutions. This is likely to be followed by systems that involve more objectivity, less dependence upon instructor approval, more openness to public scrutiny and more involvement of students in self-evaluation. Comprehensive exams, performance tests, successful completion of a project, ratings on the job, oral exams, class review of individual self-evaluations will be more and more in use.

Because of the concern of students for the relevance of education to their own interests, problems and plans, increasing use will be made of direct experience in learning and less dependence on lectures and reading. Cooperative education, the planned correlation between work experience and education on the campus, will be greatly expanded. During the past five years, the number of colleges employing cooperative education has more than doubled. This form of education helps to relate the student to the world of work, gives him a sense of confidence in his adult potential, helps to give meaning to what he is learning in college and furnishes income to defray some of his expenses. Expanded to public and voluntary agencies, it becomes a major laboratory for college education.

The wide range of student abilities, interests and backgrounds will stimulate the establishment of a variety of admission policies among the many colleges and universities in this country. Most of the junior and community colleges will continue to admit any youth who has graduated from high school and any adult who presents evidence of interest and basic background required for the course he intends to pursue. Some institutions will restrict their admissions to applicants who have made high grades in high school and high scores on scholastic aptitude tests. Others will select in ways to get a "student mix" believed to be favorable to active learning which is commonly defined as including students from various races and ethnic backgrounds, with a variety of interests and achievements in school, extracurricular and community activities. Still others will select students in terms of occupational interests or other bases for specialization in college and university. Some states will follow the California pattern, which specifies the kinds of students that are admissible to each of the three systems of public higher education in that state. In general, every high school graduate who wants to go to college will be admissible to some institution within 100 miles of his residence.

Staffing patterns will be modified by the needs created by the changes in curricula, in teaching and learning practices and in the relation to the research and graduate institutions. The ratio of students to teachers in the institution will be higher than the present average of four-year institutions but probably not as high as the average student-teacher ratio in junior colleges. The use of such technological devices as overhead projectors, motion pictures, video tapes, closed circuit TV, audio recorders and computers will increase as students discover their values to aid them in learning. The addition of these devices will probably not be the occasion to reduce the number of faculty members but rather to increase the effectiveness of learning.

Mention has been made earlier of the shift in forces exerting influences and partial control of colleges and universities. It seems probable that students and their parents will have more influence than at present through representation in internal committees, through membership on advisory boards, through membership on boards of trustees, through direct confrontation with faculty members and administrators, and through lawmakers. Potential employers will have more influence because more of them now seek college-trained personnel. Their influence will be exerted through financial grants, through direct persuasion with faculty members and administrators, through boards of trustees and through lawmakers. Legislators will have more influence because the need for public funds has grown more acute and legislators are demanding reviews by the university of its policies, programs and practices. This applies primarily to state legislators but also to some extent the Congress will exert a powerful influence.

At this time, faculty members have the greatest influence of all groups on university policy, and the influence of the administrators is lower than in the past. Ten years from now, as these other forces exert strong efforts, the faculty power will be reduced and the administrators' influence will rise somewhat because the administration is in a better position to deal constructively with external forces than is the faculty.

CONCLUSION

The foregoing essay presents a picture of the changing scene in American higher education as I view it from 47 years of active involvement in its as professor, administrator and consultant. Great changes are now going on in colleges and universities. They face new tasks, they find that they are involved with students who differ in significant respects from those they have known before. They are encountering new pressures from new sources—student protests, faculty unrest, research demands, parent displeasure, and increasing financial problems. In this flux of difficulties, the colleges and universities will not all respond in the same way, but I believe that some of the directions of movement can be foreseen and I have reported them here. Only time can prove the validity or error of these projections.

For the Federal Government to respond constructively to these anticipated changes in higher education wil require some pioneering measures. Higher education has become too large an enterprise to be greatly aided by small and unrelated pieces of legislation and revenue measures. Legislation is needed that states more comprehensively and clearly than earlier acts what is the national interest in higher education, both public and private. This statement, like the Full Employment Act, should furnish a previously missing standard for planning, for developing enabling legislation and for making appropriations. It would affirm the need in a strong modern nation for a continually expanding number of well-educated people to furnish the technical, professional, and managerial personnel required by our industrial, commercial, agricultural, and service occupations and to prepare leaders with knowledge and vision in our political, military and social institutions. It would recognize the major role played by higher education in providing for social mobility and the limited opportunities previously available to some sectors of our society. It would state the national interest in the full development of its citizens both to strengthen the country and to contribute to our democratic aspirations that every one may be able to live fruitfully and to enjoy liberty and the pursuit of happiness. It would recognize the discrepancies among the states between their educational needs and their resources and would affirm the purpose of the federal government to help in eliminating race, geographic origin and income as barriers to educational opportunity.

Other legislation, particularly appropriation bills, should be shaped so as to encourage effectiveness and efficiency in the operation of colleges and universities, and to reduce the wastes of obsolete policies and practices. This might include some of the following:

1. Channeling support through student stipends to increase institutional responsiveness to the demands of students and their parents.
2. Concentrating support where greatest needs exist rather than dissipating resources through widely scattered efforts. Among the greatest needs are the support of students from families with low incomes, institutional support where the college is rendering an important educational service not otherwise available in that area, support of special developments like work-study cooperative education that represents a promising innovation in improving the amount or quality of learning. It is important to avoid a method of support which simply increases funds available without requiring an analysis of educational problems in the institution and a plan to focus efforts on promising solutions to the problems. When grants are made to educational institutions without categorical provisions, most of the increased funds are allocated on the faculty-administration bargaining table and not on the basis of critical educational problems.
3. Changing one of the provisions of most current legislation that limits the institutions qualifying to those that are accredited. This tends to support present policies, admission practices, staffing formulas, and teaching arrangements, rather than encouraging the development of policies and practices based on the new conditions, the new opportunities and the knowldege gained from experimentation.
4. Encouraging and supporting research and demonstrations dealing with critical problems in colleges and universities. This would include experiments on measuring educational results and techniques for planning based on cost-benefit analyses. The knowledge and tools gained from sustained efforts of this sort should greatly aid in improviding the effectiveness and efficiency of American institutions of higher education.

The Planning of U.S. Higher Education: Projections of Enrollment, Degrees, Staff, and Expenditures to 1977–78

*Kenneth A. Simon**

I. PROCEDURES AND RELATIONSHIP TO PLANNING FOR HIGHER EDUCATION

General Background and Procedures

The data and projections are for all colleges and universities in the 50 States and D.C. which offer degree-credit courses.

We have depended almost entirely on published and unpublished data and projections available in the National Center for Educational Statistics, U.S. Office of Education. The projections shown here are identical with the ones shown in the Center's *Projections of Educational Statistics to 1977–78.* (See bibliography.) For the projection we are showing here, we made the following decisions:

a. Figures will be shown for 1957–58, 1967–68, and 1977–78.

b. The projection will show what is expected to happen and will not necessarily reflect total needs for institutions of higher education.

c. Our presentation will be limited to a single set of projections based on a single set of reasonable assumptions. (It would be possible, of course, to show alternative projections based on different sets of assumptions which could be as valid as the ones shown here.)

General Methodology

In most cases, regression methods were used wherever a trend could be established. Where no consistent series was available or the data proved to be too irregular to establish a trend, a constant based on observations for the last year or so was used.

For establishing the trend, observations in the 10 most recent years were used, and these were extrapolated 10 years into the future. The 10-year time span was considered better than a longer time span because of the improvement in the available statistics in recent years and the rapid changes in economic and social conditions.

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Straight lines fitted by the least squares technique to the ratio (for example, of expenditures to enrollment) as the dependent variable and time in years as the independent variable were used for projecting whenever possible. The rationale for using the straight line with rates is that the long-range, true curve of relationship would be likely to yield a straight line over any portion covering only a 10-year span.

The fitted line often lies considerably above or below the last observed point, resulting in an unusual rise or drop from the last actual observation. To avoid this and give face validity to the projections, the line was used only to establish the last point and a new line was drawn through the last observed ratio and the end point on the curve. (In this case, the fitted equation is used only to establish the ratio at the end of the 10-year span.) The rates were then applied to the appropriate population or enrollment figures.

With the exception of the part on expenditures, most mathematical models and equations were omitted from this report. However, the equations and further details about the methodology for developing the trend projections shown here are available in the U.S. Office of Education publication: *Projections of Educational Statistics to 1977–78* (see bibliography).

RELATIONSHIP TO NATIONAL PLANNING

The foregoing explanation of the procedures and methodology used in presenting this paper essentially describe the purpose and limitations of the projections developed here. Stated simply, they show what we might expect in the way of higher education enrollments, degrees, staffing, and expenditures if the trends of the past 10 years continue throughout the next decade.

These projections should prove quite useful to planners for the following reasons:

a. They enable one to find out how things would look if present efforts and resources were continued.

b. They provide a convenient set of coordinated figures on the major items which could be used as the base for adding other items or for making further breakdowns of items already projected.

c. They provide a convenient starting point for measuring the effects of implementing programs designed to change past trends.

This last point deserves some amplification because it implies that these coordinated projections contain some of the essential elements of a simplified educational model. That is, a change in one of the major items, such as enrollment, should, in the long run, create proportional changes in degrees, staff, and expenditures. There are numerous ways in which the projections shown in this report could depart from the trend. For example, a recent unpublished study by Dr. Joseph Froomkin, Assistant Commissioner for Program Planning and Evaluation in the U.S. Office of Education, shows that, by 1977, total college enrollment would be almost 20 percent higher than the trend figures projected here if a large number of financial restraints were removed from those persons able and willing to attend college. This, then, could result in a 20 percent increase in degrees, staffing, and expenditures.

On the other hand, a reversal in the trend for larger proportions of college-age persons to attend college could result in a decrease in the degrees, staffing, and expenditures shown in our trend projections. This treatment of our trend projections as an educational model is perhaps an oversimplification of the results to be expected if changes were made in any of the main items projected (enrollment, degrees, staffing, and expenditures). However, they at least provide a convenient framework for analyzing and measuring the factors that cause departures from the trend. Also, experience has taught us that they represent our best estimates of what we might generally expect to happen to enrollment, degrees, staffing and expenditures during the next decade. In any case, we hope that the trend projections which follow will be utilized in the light of their uses and limitations that we have described here.

II. ENROLLMENT

Total Opening Fall Enrollment in Institutions of Higher Education

Fall enrollment in 4-year and 2-year institutions of higher education, as reported in the opening fall enrollment series, includes resident and extension, full-time and part-time students taking work creditable toward a bachelor's or higher degree; and also resident and extension, full-time and part-time students in occupational or general studies programs not chiefly creditable toward a bachelor's degree but preparing for a technical, semi-professional, or craftsman-clerical position. It excludes students in adult education courses, correspondence, television, and radio courses, and students in subcollegiate departments of higher educational institutions. Fall enrollment in higher educational institutions increased from an estimated 3.2 million in 1957 to 6.9 million in 1967 and is expected to be 10.7 million in 1977, of which 9.2 percent are expected to be in occupational or general studies programs.

Of the 9.7 million students expected in 1977 who will be taking work toward a bachelor's or higher degree, 1.3 million or 13.4 percent are expected to be seeking degrees beyond the bachelor's or first-professional level. Of the remaining 8.4 million, who are seeking undergraduate degrees, about one-fourth will be entering college for the first time. (See table 1.)

Table 1.—*Total enrollment in all institutions of higher education, by degree-credit status and level: United States, fall 1957, 1967, and 1977* [1]

[Resident and extension opening fall enrollment]

Enrollment	1957	1967	[2] 1977
Total degree credit and nondegree credit	3,224,000	6,912,000	10,667,000
Total degree credit	3,047,000	[3] 6,348,000	9,684,000
Graduate (resident only)	[4] 288,000	[4] 688,000	1,279,000
Undergraduate and 1st professional	[5] 2,760,000	5,659,000	8,405,000
1st-time freshman	724,000	[3] 1,439,000	2,127,000
Other	2,036,000	[3] 4,220,000	6,278,000
Total nondegree credit [6]	176,000	[3] 564,000	984,000

[1] Includes both resident and extension enrollment unless otherwise noted. Does not include the following type of enrollment in institutions of higher education: (1) Adult education (degree-credit and non-degree-credit courses of approximately regular length but taken without reference to credit toward a degree or other formal award, by persons who have terminated their formal education); (2) degree-credit and non-degree-credit courses by mail, television, or radio; (3) short courses (considerably less than regular length but offering instruction on at least 4 separate days); and (4) individual lessons only (as in music, art, speech, etc.).

[2] Projected.

[3] Estimated based on 1966 and 1967 opening fall surveys of total degree-credit and non-degree-credit enrollment not reported separately, and on preliminary data from the 1966 comprehensive survey of total degree-credit and total non-degree-credit enrollment reported separately.

[4] Estimate includes resident graduate students in liberal arts and sciences and students taking work beyond the first-professional degree. Graduate enrollment is somewhat higher than enrollment for advanced degrees because graduate enrollment includes students taking work at the graduate level who are not enrolled for advanced degrees.

[5] Estimate includes students studying for degrees such as M.D., D.D.S., D.V.M., LL.B., B.D., and other degrees classified as first-professional. These students represented 3.7 percent of all undergraduate and first-professional enrollments in 1963.

[6] Vocational or general studies programs, not chiefly creditable toward a bachelor's or higher degree and extending not more than 3 years beyond high school, are designed to prepare for immediate employment in an occupation or cluster of occupations.

Note: Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

The basic assumptions upon which the above figures are based are shown with the individual elements that make up these totals.

FIRST-TIME OPENING FALL ENROLLMENT IN DEGREE-CREDIT COURSES

First-time opening fall enrollment in degree-credit courses increased from 0.7 million in 1957 to an estimated 1.4 million in 1967 and is expected to be 2.1 million in 1977. Projected first-time degree-credit enrollment in all institutions of higher education is based on the assumption that first-time enrollment as a percentage of the population averaging 18 years of age will continue the 1957–67 trend. This percentage increased from 31 in 1957 to 40 in 1966 and is expected to be 50 in 1977. (See table 2.)

The distribution of first-time enrollment by sex and by control of the institution attended shows that women increased their percentage of first-time enrollment from 39 percent in 1957 to 43 percent in 1967 and are expected to reach 46 percent of all first-time degree-credit enrollment by 1977. The percentage of first-time degree-credit enrollment in public institutions increased from 60 percent in 1957 to 71 percent in 1967 and is expected to be 77 percent in 1977.

TABLE 2.—*1st-time freshman degree-credit enrollment in all institutions of higher education, by sex, and by institutional control; United States, fall 1957, 1967, and 1977*

[Resident and extension opening fall enrollment]

Enrollment	1957	1967[1]	1977[2]
1st-time freshman degree credit	723, 879	1, 439, 000	2, 127, 000
Men	441, 969	814, 000	1, 145, 000
Women	281, 910	626, 000	982, 000
Publicly controlled	434, 066	1, 024, 000	1, 632, 000
Privately controlled	289, 813	415, 000	495, 000

[1] Estimates based on 1966 and 1967 opening fall surveys of 1st-time degree-credit and nondegree-credit enrollment not reported separately, and on preliminary data from fall 1966 comprehensive survey of total degree-credit and total non-degree-credit enrollment reported separately; 1st-time non-degree-credit enrollment was not reported prior to fall 1966.

[2] The projection of 1st-time opening fall degree-credit enrollment in all institutions of higher education by sex and by institutional control is based on the assumption that 1st-time enrollment, expressed as a percentage of the population averaging 18 years of age, will follow the 1957–67 trend to 1977 in each category of enrollment. Veterans attending college through aid provided by the Veterans' Readjustment Benefits Act of 1966 are included in the trend projections.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data from U.S. Department of Health, Education, and Welfare, Office of Education circulars: (1) "Opening (fall) Enrollment in Higher Education," annually, 1957 through 1967; and (2) unpublished preliminary data from "Resident and Extension Enrollment in Institutions of Higher Education," fall 1966.

First-time degree-credit opening fall enrollment is broken down between 4-year institutions and 2-year institutions. First-time enrollment in 2-year institutions represented 23 percent of all first-time degree-credit enrollment in 1957, 31 percent in 1967, and is expected to be 34 percent by 1977. (See tables 3 and 4.)

TABLE 3.—*1st-time freshman degree-credit enrollment in 4-year institutions of higher education, by sex, and by institutional control: United States, fall 1957, 1967, and 1977*

[Resident and extension opening fall enrollment]

Enrollment	1957	1957[1]	1977[2]
1st-time freshman degree credit	556, 239	992, 000	1, 399, 000
Men	337, 932	548, 000	720, 000
Women	218, 307	444, 000	679, 000
Publicly controlled	293, 544	628, 000	983, 000
Privately controlled	262, 695	364, 000	416, 000

[1] Estimates based on 1966 and 1967 opening fall surveys of 1st-time degree-credit and non-degree-credit enrollment not reported separately, and on preliminary data from fall 1966 comprehensive survey of total degree-credit and total non-degree-credit enrollment reported separately. 1st-time non-degree-credit enrollment was not reported prior to fall 1966.

[2] The projection of 1st-time opening fall degree-credit enrollment in 4-year institutions of higher education by sex and by institutional control is based on the assumption that 1st-time enrollment, expressed as a percentage of the population averaging 18 years of age, will follow the 1957–67 trend to 1977 in each category of enrollment. Veterans attending college through aid provided by the Veterans' Readjustment Benefits Act of 1966 are included in the trend projections.

NOTE: Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data from U.S. Department of Health, Education, and Welfare, Office of Education, circulars: (1) "Opening (Fall) Enrollment in Higher Education," annually, 1957 through 1967; and (2) unpublished preliminary data from "Resident and Extension Enrollment in Institutions of Higher Education," fall 1966.

TABLE 4.—*1st-time freshman degree-credit enrollment in 2-year institutions of higher education, by sex, and by institutional control; United States, fall 1957, 1967, and 1977*

[Resident and extension opening fall enrollment]

Enrollment	1957	1967 [1]	1977 [2]
1st-time freshman degree credit	167,640	447,000	728,000
Men	104,037	266,000	425,000
Women	63,603	181,000	303,000
Publicly controlled	140,522	396,000	649,000
Privately controlled	27,118	51,000	79,000

[1] Estimates based on 1966 and 1967 opening fall surveys of 1st-time degree-credit and non-degree-credit enrollment not reported separately, and on preliminary data from fall 1966 comprehensive survey of total degree-credit and total non-degree-credit enrollment reported separately; 1st-time non-degree-credit enrollment was not reported prior to fall 1966.

[2] The projection of 1st-time opening fall degree-credit enrollment in 2-year institutions of higher education by sex and by institutional control is based on the assumption that 1st-time enrollment, expressed as a percentage of the population averaging 18 years of age, will follow the 1957–67 trend to 1977 in each category of enrollment. Veterans attending college through aid provided by the Veterans' Readjustment Benefits Act of 1966 are included in the trend projections.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data from U.S. Department of Health, Education, and Welfare, Office of Education circulars: (1) "Opening (Fall) Enrollment in Higher Education," annually, 1957 through 1967; and (2) unpublished preliminary data from "Resident and Extension Enrollment in Institutions of Higher Education," fall 1966.

The enrollment of men accounted for 62 percent of first-time degree-credit enrollment in 2-year institutions in 1957, 60 percent in 1967, and 58 percent in 1977. Most students who enroll for the first time in 2-year colleges attend publicly controlled institutions. The percentage in public institutions rose from 84 percent in 1957 to 89 percent in 1967, and is expected to remain 89 percent in 1977.

TOTAL OPENING FALL ENROLLMENT IN DEGREE-CREDIT COURSES

Total opening fall enrollment in courses creditable toward a bachelor's or higher degree in all institutions of higher education increased from 3.0 million in 1957 to an estimated 6.3 million in 1967 and is expected to climb to 9.7 million by 1977. These figures include all resident and extension, full-time and part-time, graduate, undergraduate, and first-professional enrollment in degree-credit courses in 4-year institutions and in 2-year institutions. They include first-time as well as more advanced students. (See table 5.)

Projections of total opening fall degree-credit enrollment in all institutions of higher education were made separately for men and women by type and by control of the institution attended. They are based on the assumption that the percentage of college-age people enrolled in college in each of the above enrollment categories will continue to increase from 1968 to 1977 as it did from 1957 to 1967. Attendance status was projected by holding constant, through 1977, the 1967 percentage of full-time enrollment in each enrollment category.

TABLE 5.—*Total degree-credit enrollment in all institutions of higher education, by sex, by attendance status, and by institutional control—United States, fall 1957, 1967, and 1977*

[Resident and extension opening fall enrollment]

Enrollment	1957	1967 [1]	1977 [2]
Total degree credit	3,047,373	6,348,000	9,684,000
Men	1,991,411	3,800,000	5,470,000
Women	1,055,962	2,548,000	4,214,000
Full-time attendance [3]	2,077,000	4,560,000	6,830,000
Part-time attendance [3]	970,000	1,788,000	2,854,000
Publicly controlled	1,762,726	4,305,000	7,102,000
Privately controlled	1,284,647	2,043,000	2,581,000

[1] Estimates based on 1966 and 1967 opening fall surveys of total degree-credit and non-degree-credit enrollment not reported separately, and on preliminary data from the 1966 comprehensive survey of total degree-credit and total non-degree-credit enrollment reported separately.

[2] The projection of total degree-credit enrollment in all institutions by sex and institutional control is based on the assumption that enrollment in these institutions, expressed as a percentage of population aged 18–21 years, will follow the 1957–67 trend to 1977 in each enrollment category.

The projection of total degree-credit enrollment in all institutions by attendance status is based on the assumption that in each enrollment category the ratio of full-time enrollment to total enrollment reported in the 1966 comprehensive enrollment survey, with minor adjustments, will remain constant to 1977. Veterans attending college through aid provided by the Veterans' Readjustment Benefits Act of 1966 are included in the trend projections.

[3] Attendance status for 1957 through 1961 and for 1966 and 1967 is estimated from 1st-term enrollment by attendance status reported in comprehensive enrollment surveys, 1959, 1961, and 1966.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data and estimates are based on U.S. Department of Health, Education, and Welfare, Office of Education circulars: (1) "Opening (Fall) Enrollment in Higher Education," annually, 1957 through 1967; (2) "Resident and Extension Enrollment in Institutions of Higher Education," biennially, 1st term 1957 through 1963; and (3) unpublished preliminary data from "Resident and Extension Enrollment in Institutions of Higher Education," fall 1966.

The proportion of women enrolled in all institutions of higher education has increased in the past decade from 35 percent in 1957 to 40 percent in 1967. It is expected to be 44 percent by 1977. The distribution also shows that about 72 percent of all opening fall degree-credit students attend college full time. There is, however, considerable variation in the 1967 percentages of full-time attendance among the different categories of students by sex and by institutional type and control. The 1967 percentages are expected to continue with only minor changes through 1977. Public institutions drew an increasing percentage of total enrollment, 58 percent in 1957 and 68 percent in 1967. The enrollment in public institutions was 1.8 million in 1957 and an estimated 4.3 million in 1967. This contrasted with an enrollment in private institutions of 1.3 million in 1957 and an estimated 2.0 million in 1967. Projected enrollment for 1977 is 7.1 million in public institutions and 2.6 million in private institutions. About 83 percent of all degree-credit enrollment is in 4-year institutions, and the enrollment patterns in these institutions resemble closely those of all institutions.

Total degree-credit opening fall enrollment in 2-year institutions represented 12 percent of total degree-credit enrollment in 1957, and 17 percent in 1967. Total degree-credit undergraduate enrollment in 2-year institutions rose from 0.4 million in 1957 to an estimated 1.1

million in 1967 and is projected as 1.9 million in 1977. Men represented about 60 percent of the degree-credit enrollment in both types of institutions in 1967. The pattern of enrollment in other respects differed considerably between the 2-year and 4-year institutions. Forty-one percent of degree-credit students in 2-year institutions were part-time: in 4-year institutions, 25 percent were part-time. Ninety percent of degree-credit students in 2-year institutions attended public institutions; in 4-year institutions, 63 percent were in public institutions. (See tables 6 and 7.)

ESTIMATED OPENING FALL ENROLLMENT BY LEVEL AND TYPE OF INSTITUTION

Resident graduate enrollment and resident and extension undergraduate and first-professional enrollment, as components of total opening fall degree-credit enrollment in 4-year and 2-year institutions, were estimated and projected. Since opening fall degree-credit enrollment was not reported by level prior to fall 1967, the graduate and undergraduate levels had to be estimated from information provided by other studies in the Office of Education. (See table 8.)

TABLE 6.—*Total degree-credit enrollment in 4-year institutions of higher education, by sex, by attendance status, and by institutional control: United States, fall 1957, 1967, and 1977*

[Resident and extension opening fall enrollment]

Enrollment	1957	1967 [1]	1977 [2]
Total degree-credit	2,678,211	5,272,000	7,825,000
Men	1,753,732	3,147,000	4,362,000
Women	924,479	2,126,000	3,463,000
Full-time attendance [3]	1,871,000	3,930,000	5,746,000
Part-time attendance [3]	807,000	1,343,000	2,079,000
Publicly controlled	1,446,736	3,338,000	5,423,000
Privately controlled	1,231,475	1,934,000	2,402,000

[1] Estimate based on 1966 and 1967 opening fall surveys of total degree-credit and non-degree-credit enrollment not reported separately, and on preliminary data from the 1966 comprehensive survey of total degree-credit and total non-degree-credit enrollment reported separately.

[2] The projection of total degree-credit enrollment in 4-year institutions by sex and institutional control is based on the assumption that enrollment in these institutions, expressed as a percentage of population aged 18 to 21 years, will follow the 1957–67 trend to 1977 in each enrollment category.

The projection of total degree-credit enrollment in 4-year institutions by attendance status is based on the assumption that in each enrollment category the ratio of full-time enrollment to total enrollment reported in the 1966 comprehensive enrollment survey, with minor adjustments, will remain constant to 1977.

Veterans attending college through aid provided by Veterans' Readjustment Benefits Act of 1966 are included in the trend projections.

[3] Attendance status for 1957 through 1961 and for 1966 and 1967 is estimated from 1st-term enrollment by attendance status reported in comprehensive enrollment surveys, 1959, 1961, and 1966.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data and estimates are based on U.S. Department of Health, Education, and Welfare, Office of Education circulars: (1) "Opening (Fall) Enrollment in Higher Education," annually, 1957 through 1967; (2) "Resident and Extension Enrollment in Institutions of Higher Education," biennially, 1st term 1957 through 1963; and (3) unpublished preliminary data from "Resident and Extension Enrollmenti n Institutions of Higher Education," fall 1966.

TABLE 7.—*Total degree-credit enrollment in 2-year institutions of higher education, by sex, by attendance status, and by institutional control: United States, fall 1957, 1967, and 1977*

[Resident and extension opening fall enrollment]

Enrollment	1957	1967 [1]	1977 [2]
Total degree credit	369,162	1,075,000	1,859,000
Men	237,679	653,000	1,107,000
Women	131,483	422,000	751,000
Full-time attendance [3]	206,000	630,000	1,084,000
Part-time attendance [3]	163,000	445,000	775,000
Publicly controlled	315,990	967,000	1,679,000
Privately controlled	53,172	109,000	180,000

[1] Estimate based on 1966 and 1967 opening fall surveys of total degree-credit and non-degree-credit enrollment not reported separately, and on preliminary data from the 1966 comprehensive survey of total degree-credit and total non-degree-credit enrollment reported separately.

[2] The projection of total degree-credit enrollment in 2-year institutions by sex and institutional control is based on the assumption that enrollment in these institutions, expressed as a percentage of population aged 18–21 years, will follow the 1957–67 trend to 1977 in each enrollment category. The projection of total degree-credit enrollment in 2-year institutions by attendance status is based on the assumption that in each enrollment category the ratio of full-time enrollment, to total enrollment reported in the 1966 comprehensive survey, with minor adjustments, will remain constant to 1977. Veterans attending college through aid provided by the Veterans' Readjustment Benefits Act of 1966 are included in the trend projections.

[3] Attendance status for 1957 through 1961 and for 1966 and 1967 is estimated from 1st-term enrollment by attendance status reported in comprehensive enrollment surveys, biennially, 1957 through 1963, and 1966.

Note: Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data and estimates are based on U.S. Department of Health, Education, and Welfare, Office of Education circulars: (1) "Opening (Fall) Enrollment in Higher Education," annually, 1957 through 1967; (2) "Resident and Extension Enrollment in Institutions of Higher Education," biennially, 1st-term 1957 through 1963; and (3) unpublished preliminary data from "Resident and Extension Enrollment in Institutions of Higher Education," fall 1966.

TABLE 8.—*Total degree-credit enrollment in all institutions of higher education, by level and institutional type: United States, fall 1957, 1967, and 1977*

[Resident and extension opening fall enrollment]

Enrollment	1957	1967	1977 [1]
Total degree credit	3,047,000	[2] 6,348,000	9,684,000
4-year institutions	2,678,000	[2] 5,272,000	7,825,000
Graduate (resident only)	[3] 288,000	[3] 688,000	1,279,000
Undergraduate and 1st professional	[3] 2,391,000	[3] 4,584,000	6,546,000
2-year institutions	369,000	[2] 1,075,000	1,859,000

[1] The projection of resident graduate enrollment in 4-year institutions was made separately by sex and by institutional control and is based on the assumption that in each enrollment category the proportion of total enrollment at the graduate level will continue the 1957–67 trend to 1977. The projection of undergraduate and 1st-professional degree-credit enrollment in 4-year institutions is the difference between projected total degree-credit enrollment in 4-year institutions and resident graduate enrollment in 4-year institutions. The projection of undergraduate degree-credit enrollment in 2-year institutions of higher education is the same as that shown in table 7.

[2] Estimate based on 1966 and 1967 opening fall surveys of total degree-credit and non-degree-credit enrollment not reported separately, and on 1966 comprehensive survey of total degree-credit and total non-degree-credit enrollment reported separately.

[3] Total degree-credit enrollment by level was estimated from first-term enrollment by level reported in comprehensive enrollment surveys, biennially, 1957 through 1963, and from 1st-professional and graduate enrollment reported separately in the 1963 comprehensive enrollment survey, and together in the 1967 opening fall enrollment survey. Veterans attending college through aid provided by the Veterans' Readjustment Benefits Act of 1966 are included in the trend projection.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data and estimates are based on U.S. Department of Health, Education, and Welfare, Office of Education publications: (1) "Opening (Fall) Enrollment in Higher Education," annually 1957 through 1967; (2) "Resident and Extension Enrollment in Institutions of Higher Education," biennially, 1957 through 1963; and (3) unpublished peliminary data from "Resident and Extension Enrollment in Institutions of Higher Education," fall 1966.

The estimates of resident graduate enrollment from 1957 through 1963 were based on theoretical percentages derived from projection equations. The equations were based on resident graduate enrollment as a percentage of total resident and extension enrollment in 4-year institutions as observed over a period of 7 years, and computed separately for each sex and control category. The Office of Education studies from which the basic data for these estimates were obtained were the biennial comprehensive surveys of enrollments in higher education for the first term 1957 through 1961 and the survey of migration of college students, 1963. Percentages derived from the resulting equations were applied to corresponding categories of opening fall enrollment in 4-year institutions to estimate resident graduate enrollment. The equations were updated for making the 1968 projections by including an estimate of 1967 graduate enrollment based on the 1967 opening fall enrollment report of postbaccalaureate enrollment. (See table 9.)

The estimates show that resident graduate enrollment has been the fastest growing component of total degree-credit enrollment. It increased from an estimated 0.3 million in 1957 to 0.7 million in 1967, an increase of 133 percent compared to an increase of 105 percent for estimated undergraduate and first-professional enrollment in the same period. The current draft rules are expected to slow this growth somewhat but no exact measurement of their effects is possible at this time.

TABLE 9.—*Estimated graduate degree-credit enrollment in 4-year institutions of higher education, by sex, by attendance status, and by institutional control: United States, fall 1957, 1967, and 1977*

[Resident opening, fall enrollment]

Enrollment	1957 [1]	1967 [1]	1977 [2]
Graduate (resident only)	288, 000	688, 000	1, 279, 000
Men	208, 000	453, 000	798, 000
Women	80, 000	236, 000	481, 000
Full-time attendance	113, 000	298, 000	560, 000
Part-time attendance	174, 000	390, 000	719, 000
Publicly controlled	145, 000	435, 000	919, 000
Privately controlled	142, 000	254, 000	360, 000

[1] Graduate enrollment by sex and institutional control was estimated from 1st-term graduate enrollment reported in comprehensive enrollment surveys, biennially, 1957 through 1963, and from 1st-professional graduate enrollment reported separately in the 1963 comprehensive enrollment survey and together in the 1967 opening fall enrollment survey.

Graduate enrollment by attendance status was estimated from 1st-term graduate enrollment by attendance status reported in the 1959 and 1961 comprehensive enrollment surveys. These estimates together with similar estimates for undergraduate enrollment were adjusted to agree with total enrollment by attendance status reported in the opening fall enrollment surveys, annually, 1962 through 1967 and in the 1966 comprehensive enrollment survey.

[2] The projection of graduate enrollment by sex and by control of institution is based on the assumption that in each enrollment category the proportion of total enrollment at the graduate level will continue the 1957–67 trend to 1977.

The projection of graduate enrollment by attendance status is based on the assumption that in each enrollment category the estimated ratio of full-time enrollment to total enrollment reported in the 1966 comprehensive enrollment survey, with minor adjustments, will remain constant to 1977.

Veterans attending college through aid provided by the Veterans' Readjustment Act of 1966 are included in the trend projection.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data and estimates are based on U.S. Department of Health, Education, and Welfare, Office of Education publications: (1) "Opening (Fall) Enrollment in Higher Education," annually, 1957 through 1967; (2) "Resident and Extension Enrollment in Institutions of Higher Education," biennially, 1957 through 1963; and (3) unpublished preliminary data from "Resident and Extension Enrollment in Institutions of Higher Education," fall 1966.

ESTIMATED RESIDENT GRADUATE OPENING FALL ENROLLMENT

Resident graduate opening fall enrollment and the distribution of this enrollment by sex, by attendance status, and by control of the institution attended were projected. These projects make no allowance for the effects of the present draft rules on the number of graduate students. The projections by sex and by control of institution are based on the assumption that the proportion of the total degree-credit enrollment at the graduate level within each sex and control group will continue the 1957–67 trend to 1977. The projection by attendance status is based on the assumption that in each sex and control group, the 1967 ratio of estimated full-time graduate enrollment to total graduate enrollment will remain constant to 1977.

The distribution of graduate enrollment by sex shows a somewhat greater increase in graduate enrollment of women than in that of men. This trend may be expected to continue and perhaps to accelerate as a result of the military draft of graduate students. Women represented 28 percent of all graduate enrollment in 1957, 34 percent in 1967, and a projected 38 percent in 1977. A greater percentage of graduate enrollment was full time and a greater percentage was in public institutions in 1967 than in 1957. Full-time enrollment was 39 percent of all graduate enrollment in 1957 and 43 percent in 1967. It is expected to remain at or near 43 percent through 1977. Public institutions drew 50 percent of all graduate enrollment in 1957, 63 percent in 1967, and are expected to have 72 percent by 1977.

ESTIMATED RESIDENT AND EXTENSION UNDERGRADUATE AND FIRST-PROFESSIONAL OPENING FALL ENROLLMENT

Undergraduate and first-professional opening fall enrollment together with the distribution of this enrollment by sex, by attendance status, and by control of the institution attended were projected next. The projections by sex and by control of institution are based on the assumption that within each sex and institutional type and control category the proportion of the total enrollment at the undergraduate and first-professional level will follow the 1957–67 trend to 1977. The projection of undergraduate and first-professional enrollment by attendance status is based on the assumption that the 1967 ratio of estimated full-time undergraduate and first-professional enrollment to total undergraduate and first-professional enrollment in each sex and institutional type and control group will remain constant to 1977. (See table 10.)

The distribution of undergraduate and first-professional students by sex, by attendance status, and by control of the institution attended differed greatly from that of resident graduate students. In 1967, men accounted for 59 percent of the undergraduate and first-professional students, and 66 percent of the resident graduate students. Seventy-five percent of undergraduate and first-professional students were full-time students, as contrasted with 43 percent of resident graduate students. Public institutions drew 68 percent of undergraduate and first-professional students and 63 percent of resident graduate students.

TABLE 10.—*Estimated undergraduate and 1st-professional degree-credit enrollment in all institutions of higher education, by sex, by attendance status, and by institutional control—United States, fall 1957, 1967, and 1977*

[Resident and extension opening fall enrollment]

Enrollment	1957 [1]	1967 [1]	1977 [2]
Undergraduate degree credit and 1st professional	2,760,000	5,659,000	8,405,000
Men	1,783,000	3,347,000	4,672,000
Women	976,000	2,312,000	3,733,000
Full-time attendance	1,964,000	4,261,000	6,270,000
Part-time attendance	796,000	1,398,000	2,135,000
Publicly controlled	1,618,000	3,870,000	6,183,000
Privately controlled	1,142,000	1,789,000	2,222,000

[1] Estimated undergraduate and 1st-professional degree-credit enrollment in all institutions by sex, by attendance status, and by institutional control is the sum of undergraduate enrollment in 2-year institutions (table 7) and estimated undergraduate and 1st-professional enrollment in 4-year institutions (table 11).

[2] The projection of undergraduate and 1st-professional degree-credit enrollment in all institutions by sex and by institutional control is based on the assumption that in each enrollment category the proportion of total enrollment at the undergraduate level will continue the 1957–67 trend to 1977.

The projection of undergraduate and 1st-professional degree-credit enrollment in all institutions by attendance status is based on the assumption that in each enrollment category the estimated ratio of full-time enrollment to total enrollment, reported in the 1966 comprehensive enrollment survey, with minor adjustments, will remain constant to 1977. Veterans attending college through aid provided by the Veterans' Readjustment Benefits Act of 1966 are included in the trend projection.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data and estimates are based on U.S. Department of Health, Education, and Welfare, Office of Education publications: (1) "Opening (Fall) Enrollment in Higher Education," annually, 1957 through 1967; (2) "Resident and Extension Enrollment in Institutions of Higher Education," fall 1966.

Undergraduate and first-professional enrollment in 4-year institutions shows that, in 1967, 81 percent of all undergraduate and first-professional enrollment was in 4-year institutions. Undergraduate enrollment in 2-year institutions is the same as total enrollment in these institutions. (See table 11.)

ESTIMATED OPENING FALL ENROLLMENT IN NONDEGREE-CREDIT COURSES

Opening fall enrollment in non-degree-credit courses in occupational or general studies programs (excluding adult education) rose from an estimated 176,000 in 1957 to an estimated 564,000 in 1967 and is expected to be 984,000 in 1977. Forty-one percent of this enrollment is estimated to be full time for all years 1957 to 1977. Ninety-one percent was reported in publicly controlled institutions in 1967 and this percentage is expected to rise to 93 percent in 1977. In 1957, 5 percent of all enrollment in institutions of higher education (excluding adult education) was estimated to be non-degree-credit courses in occupational or general studies, programs. In 1967 this percentage was 8 and in 1977 is expected to be 9. (See table 12.)

TABLE 11.—*Estimated undergraduate and 1st-professional, degree-credit enrollment in 4-year institutions of higher education, by sex, by attendance status, and by institutional control—United States, fall 1957, 1967, and 1977*

[Resident and extension opening fall enrollment]

Enrollment	1957 [1]	1967 [1]	1977 [2]
Undergraduate degree credit and 1st professional	2,391,000	4,584,000	6,546,000
Men	845,000	1,890,000	2,982,000
Women	1,546,000	2,694,000	3,565,000
Full-time attendance	1,758,000	3,632,000	5,186,000
Part-time attendance	633,000	953,000	1,360,000
Publicly controlled	1,302,000	2,904,000	4,504,000
Privately controlled	1,089,000	1,680,000	2,042,000

[1] Estimated undergraduate and 1st-professional enrollment in 4-year institutions by sex and institutional control is the difference between total degree-credit enrollment in 4-year institutions (table 5) and estimated graduate enrollment (table 9). Undergraduate and 1st-professional enrollment by attendance status was estimated from 1st-term undergraduate and 1st-professional enrollment by attendance status reported in comprehensive enrollment surveys, biennially, 1957 through 1963. These estimates, together with similar estimates for graduate enrollments, were adjusted to agree with total enrollment by attendance status reported in the opening fall enrollment surveys, annually, 1962 through 1967, and in the 1966 comprehensive enrollment survey.

[2] The projection of undergraduate and 1st professional degree-credit enrollment in 4-year institutions by sex and institutional control is based on the assumption that in each enrollment category the proportion of total enrollment at the undergraduate level will continue the 1957–67 trend to 1977. The projection of undergraduate and 1st-professional degree-credit enrollment in 4-year institutions by attendance status is based on the assumption that in each enrollment category the estimated ratio of full-time enrollment to total enrollment, reported in the 1966 comprehensive enrollment survey, with minor adjustments, will remain constant to 1977.

Veterans attending college through aid provided by the Veterans' Readjustment Benefits Act of 1966 are included in the trend projection.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data and estimates are based on U.S. Department of Health, Education, and Welfare, Office of Education publications: (1) "Opening (fall) Enrollment in Higher Education," annually 1957 through 1967; (2) "Resident and Extension Enrollment in Institutions of Higher Education," biennially, 1957 through 1963; and (3) unpublished preliminary data from "Resident and Extension Enrollment in Institutions of Higher Education," fall 1966.

TABLE 12.—*Total nondegree-credit enrollment in all institutions of higher education, by attendance status, and by institutional control; United States, fall 1957, 1967, and 1977*

[Resident and extension opening fall enrollment]

Enrollment	1957 [1]	1967 [1]	1977 [2]
Non-degree-credit	176,259	564,000	984,000
Full-time attendance	73,000	233,000	407,000
Part-time attendance	103,000	331,000	577,000
Publicly controlled	133,352	511,000	915,000
Privately controlled	42,907	53,000	69,000

[1] Attendance status is estimated from 1966 comprehensive enrollment survey. Data by institutional control are from the 1957 comprehensive survey plus estimates based on the 1966 comprehensive survey and the 1967 opening fall enrollment survey.

[2] The projection of total non-degree-credit enrollment by sex and institutional control, is based on the assumption that enrollment, expressed as a percentage of population aged 18 to 21 years, will follow the 1957–67 trend to 1977 in each enrollment category.

The projection of total non-degree-credit enrollment by attendance status is based on the assumption that in each enrollment category the ratio of full-time enrollment to total enrollment reported in the 1966 comprehensive enrollment survey, with minor changes, will remain constant to 1977.

Veterans attending college through aid provided by the Veterans' Readjustment Benefits Act of 1966 are included in the trend projections.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data and estimates are based on U.S. Department of Health, Education, and Welfare, Office of Education, circulars: (1) "Opening (Fall) Enrollment in Higher Education," annually, 1963 through 1967; (2) "Resident and Extension Enrollment in Institutions of Higher Education," biennially, 1957 through 1961; and (3) unpublished preliminary data from "Resident and Extension Enrollment in Institutions of Higher Education," fall 1966.

Projected total non-degree-credit opening fall enrollment and the distribution of this enrollment by attendance status of the student and by control of the institution attended were computed next. The projection of total non-degree-credit enrollment is based on the assumption that within each sex and institutional control and type category non-degree-credit enrollment expressed as a percentage of population 18–21 years of age, will follow the 1957 through 1967 trends. The projected enrollments were then summed to obtain the required totals. Full-time attendance status was estimated by holding constant to 1977 the percentage of total non-degree-credit enrollment that was estimated to be full time in 1967.

ESTIMATED OPENING FALL FULL-TIME EQUIVALENT ENROLLMENT IN DEGREE-CREDIT AND NONDEGREE-CREDIT COURSES

Estimated opening fall full-time equivalent enrollment in degree-credit and non-degree-credit courses increased from 2.5 million in 1957 to 5.5 million in 1967, and is expected to be 8.3 million in 1977. In 1967, 69 percent of this enrollment was in public institutions, and 74 percent is expected to be in public institutions in 1977. (See table 13.)

TABLE 13.—*Estimated full-time equivalent of total full-time and part-time enrollment in all institutions of higher education, by degree-credit status and institutional control; United States, fall 1957, 1967, and 1977*

[Resident and extension opening fall enrollment]

Enrollment	1957 [1]	1967 [1]	1977 [2]
Total full-time equivalent	2,499,000	5,476,000	8,340,000
Publicly controlled	1,458,000	3,766,000	6,189,000
Privately controlled	1,041,000	1,710,000	2,151,000
Degree-credit full-time equivalent	2,397,000	5,150,000	7,772,000
Publicly controlled	1,381,000	3,471,000	5,660,000
Privately controlled	1,016,000	1,679,000	2,112,000
Nondegree-credit full-time equivalent	102,000	326,000	569,000
Publicly controlled	77,000	295,000	529,000
Privately controlled	25,000	31,000	40,000

[1] The estimate of full-time equivalent enrollment, 1957–67, is the sum of full-time enrollment and full-time equivalent of part-time enrollment. (Full-time and part-time degree-credit enrollment is shown in table 5. Full-time and part-time non-degree-credit enrollment is shown in table 12.)

The estimate of full-time equivalent of part-time enrollment is based on the proportion of part-time enrollment found to be equivalent to full-time enrollment for degree-credit and for non-degree-credit students in the 1964 sample survey of full-time equivalent enrollment and credit hours. These equivalents were: For degree-credit enrollment, 33 percent of part time; for non-degree-credit enrollment, 28 percent of part time.

[2] The projection of the full-time equivalent of part-time enrollment is based on the assumption that the 1964 percentages of part-time enrollment equivalent to full-time enrollment (33 percent for degree-credit students and 28 percent for non-degree-credit students) will remain constant to 1977.

Veterans attending college through aid provided by the Veterans' Readjustment Benefits Act of 1966 are included in the trend projections.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Enrollment data and estimates are based on U.S. Department of Health, Education, and Welfare Office of Education circulars (1) "Opening (Fall) Enrollment in Higher Education," annually, 1957 through 1967; (2) "Resident and Extension Enrollment in Institutions of Higher Education," biennially, 1955 through 1961; (3) unpublished preliminary data from "Resident and Extension Enrollment in Institutions of Higher Education," fall 1966; and (4) sample survey of full-time equivalent enrollments and credit hours, fall 1964, unpublished.

Estimated full-time equivalent enrollment in degree-credit courses increased from 2.4 million in 1957 to 5.2 million in 1967 and to a projected 7.8 million in 1977. Estimated full-time equivalent enrollment in non-degree-credit courses increased from 102,000 in 1957 to 326,000 in 1967 and is expected to be 569,000 in 1977. The estimated increase from 1957 to 1967 of 220 percent in nondegree-credit full-time equivalent enrollment contrasts with an estimated increase in degree-credit full-time equivalent enrollment of 117 percent.

Projections of degree-credit and non-degree-credit opening fall full-time equivalent enrollment by control of institution are shown in the expenditure section of this presentation.

III. DEGREES

EARNED DEGREES BY LEVEL AND SEX

Earned degree reports from individual institutions of higher education are received each fall by the Office of Education. These provide information on the number of degrees granted by level and sex and by field of concentration. They cover degrees granted during the academic year ending in June and include degrees earned in the prior summer, too late for the June graduation of that year.

Three principal levels have been reported and projected: Bachelor's including first-professional degrees, master's degrees, and doctorates. Since 1960–61, first-professional degrees have been reported separately from bachelor's degrees but the definitions of what constitutes a first-professional degree have not been uniform throughout the period. For that reason, no attempt has been made to project them separately. Some of the changes shift degrees from the bachelor's and first-professional level to the master's level, but the numbers are so small that, although individual fields show large dislocations (for example, library science and social work), the totals at each level are not greatly affected.

Earned degrees for each sex at all levels—bachelor's and first-professional, master's and doctor's—have shown large increases in the last 10 years. The estimated increases were: Bachelor's degrees, over 85 percent; master's degrees and doctor's degrees, each over 100 percent. These growth rates are expected to be maintained at or near the same levels during the next 10 years for the master's and the doctorate levels. The rate for the bachelor's and first-professional degree level is expected to be more than 40 percent. (See table14.)

The total number of bachelor's and first-professional degrees granted annually rose from 364,000 in 1957–58 to an estimated 685,000 in 1967–68, and is expected to be 980,000 in 1977–78. The proportion granted to women rose from 34 percent of the total granted in 1957–58 to an estimated 41 percent in 1967–68 and, on the basis of this trend, is expected to increase to 46 percent in 1977–78.

The number of master's degrees rose from 66,000 in 1957–58 to an estimated 149,000 in 1967–68 and is expected to reach 274,000 in 1977–78. The proportion of master's degrees granted to women was 34 percent in 1965–66 and is expected to remain at about this level during the next 12 years.

The annual output of doctor's degrees increased from 8,900 in 1957–58 to an estimated 22,200 in 1967–68 and is expected to be 43,900 in

1977–78. The proportion of doctor's degrees granted to women was 12 percent in 1965–66 and is expected to remain near this level during the next 12 years.

TABLE 14.—*Earned degrees, by level and by sex of student: United States, 1957–58, 1967–68, and 1977–78*

Level of degree and sex of student	1957–58	1967–68 [1]	1977–78 [2]
Bachelor's and 1st-professional degrees [3]	363,502	685,000	980,000
Men	241,560	401,000	530,000
Women	121,942	283,000	450,000
Master's degrees (except 1st-professional) [4]	65,586	148,800	273,700
Men	44,229	99,300	186,800
Women	21,357	49,500	86,900
Doctor's degrees (except 1st-professional) [5]	8,942	22,200	43,900
Men	7,978	19,700	39,000
Women	964	2,600	4,900

[1] Estimated.

[2] The projection of earned degrees is based on the assumption that the percentage of degrees to population for each level and sex will continue the 1957–58 to 1965–66 trends. (Age of the population at the time of graduation for the 1st level was assumed to be 22 years; for the 2d level, 24 years; for the doctorate level, 27 years.)

[3] The definition of degrees considered as 1st-professional is not the same for all years.

[4] Beginning 1967–68, master's degrees include some degrees previously considered as 1st-professional.

[5] Doctor's degrees include the Ph. D. in any field as well as such degrees as doctor of education, doctor of juridical science, and doctor of public health (preceded by professional degree in medicine or sanitary engineering). They exclude degrees defined as 1st-professional, such as doctor of jurisprudence, doctor of medicine, doctor of dental surgery, doctor of veterinary medicine, and doctor of divinity.

Note: Data include 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: Degree data from U.S. Department of Health, Education, and Welfare, Office of Education, publications on "Earned Degrees Conferred by Institutions of Higher Education," 1957–58 through 1965–66.

Each level was projected separately for men and for women. The main assumption underlying these projections is that the relationships between college-age population and the number of degrees granted at each of the three levels during the 1968–69 to 1977–78 period will continue the 1957–58 through 1965–66 trend. The trend for an increasing percentage of the college-age population to complete undergraduate requirements and continue on for advanced degrees is reflected in the degree projections presented here.

EARNED DEGREES BY LEVEL AND FIELD*

The fields presented are divided into two main groups at each level. These groups are (a) natural sciences and related professions and (b) social sciences, humanities, and related professions. (See table 15.)

The projected number of earned degrees by level and field (with the exception of first-professional degrees in the health fields) are based on the assumption that the percentage distribution of degrees by field for each level will continue the 1957–58 to 1965–66 trend. For example, if the proportion of total degrees granted in a particular field has been increasing, it is assumed that it will continue to increase. Separate projections were made for men and for women.

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*NOTE.—Information which became available after the preparation of this study indicates that advanced degrees, especially master's degrees in social sciences, humanities, and related professions, will be substantially higher than shown here.

TABLE 15.—*Percentage distribution of earned degrees, by field of study and level—United States, 1957–58, 1967–68, and 1977–78*

A. NATURAL SCIENCES AND RELATED PROFESSIONS

Year (1)	Total number of degrees (2)	Total natural sciences (3)	Mathematics and statistics [1] (4)	Engineering (5)	Physical sciences [2] (6)	Biological sciences [3] (7)	Agriculture and forestry (8)	Health professions [4] (9)	Science, general program (10)
Bachelor's and 1st professional:									
1957–58	363, 502	28. 8	1. 9	9. 7	3. 9	3. 9	2. 3	6. 6	0. 5
1967–68 [5]	685, 000	24. 5	4. 2	6. 0	3. 0	5. 0	1. 2	4. 5	. 5
1977–78 [6]	980, 000	24. 1	6. 6	4. 1	2. 7	5. 5	. 3	4. 2	. 6
Master's:									
1957–58	65, 576	23. 3	1. 9	8. 8	4. 6	2. 8	2. 3	2. 6	. 3
1967–68 [5]	149, 000	25. 3	4. 2	10. 4	3. 6	3. 1	1. 3	2. 0	. 7
1977–78 [6]	274, 000	31. 1	6. 8	13. 4	3. 7	3. 5	. 3	1. 9	1. 5
Doctor's (except 1st professional):									
1957–58	8, 942	46. 7	2. 8	7. 2	18. 6	12. 6	3. 9	1. 6	0
1967–68 [5]	23, 100	51. 0	4. 7	14. 1	16. 3	11. 3	3. 3	1. 2	. 1
1977–78 [6]	42, 900	55. 2	6. 3	20. 4	14. 7	10. 5	2. 6	. 6	. 1

B. SOCIAL SCIENCES, HUMANITIES, AND RELATED PROFESSIONS

Year (1)	Total number of degrees (2)	Total social sciences and humanities (3)	Fine arts [7] (4)	Philosophy and religion [8] (5)	English and journalism (6)	Foreign languages [9] (7)	Psychology (8)	Social sciences [10] (9)	Education (10)	Library sciences (11)	Social work (12)	Other [11] (13)
Bachelor's and 1st professional:												
1957–58	363,502	71.2	5.7	1.9	5.3	1.2	1.9	12.8	17.9	0.5	0.5	23.5
1967–68 [5]	685,000	75.4	5.8	1.5	8.1	3.1	3.3	17.6	17.1	.1	.4	18.4
1977–78 [6]	980,000	75.9	5.3	1.2	10.2	4.7	4.1	20.4	16.0	.2	.6	13.3
Master's:												
1957–58	65,576	76.7	6.3	1.2	3.9	1.6	1.9	8.0	43.0	.2	.2	10.4
1967–68 [5]	149,000	74.7	5.8	.9	5.1	2.9	2.4	9.7	29.8	2.8	2.7	12.6
1977–78 [6]	274,000	68.9	5.2	.4	6.6	4.0	3.0	11.7	19.6	3.0	2.6	12.8
Doctor's (except 1st professional):												
1957–58	8,942	53.3	3.3	2.5	3.7	2.5	6.4	12.8	17.1	.2	.2	4.6
1967–68 [5]	23,100	49.0	3.2	1.9	3.9	2.8	6.5	11.6	14.5	.1	.4	4.1
1977–78 [6]	42,900	44.8	3.3	1.6	4.0	2.5	6.1	10.8	12.4	0	.5	3.6

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[1] Includes mathematics, statistics, and computer systems.

[2] Includes astronomy, chemistry, earth sciences, meteorology, physics, and other physical sciences.

[3] Includes anatomy, bacteriology, biochemistry, biology, botany, entomology, physiology, zoology, and other biological sciences.

[4] Includes dentistry, medicine and osteopathy, nursing, optometry, pharmacy, public health, veterinary medicine, and other health professions.

[5] Estimated.

[6] The projection of degrees by subject field, excluding 1st-professional degrees in the health professions, is based on the assumption that the percent distribution of degrees by field for each level and sex will continue the 1957–58 to 1965–66 trends. Projections of 1st-professional degrees in the health fields, based on estimates of expanding facilities for training together with data on student applications in excess of present capacity, were obtained from Health Manpower Statistics Branch, Health Statistics Division, National Center for Health Statistics.

[7] Includes architecture, music, speech and dramatic arts, and other fine and applied arts.

[8] Includes philosophy, scholastic philosophy, religious education and Bible, and other religious fields.

[9] Includes classical languages, French, German, Russian, other Slavic languages, and other languages and language programs.

[10] Includes anthropology, economics, geography, history, international relations, political science, public administration, sociology, and other social sciences.

[11] Includes business and commerce, home economics, law, military, naval, or Air Force science, theology, and miscellaneous and unclassified fields.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare: (1) Office of Education publications, "Earned Degrees Conferred by Institutions of Higher Education," annually, 1957–58 through 1965–66; and (2) National Center for Health Statistics unpublished estimates of degrees in health professions, 1966–67 through 1977–78.

FIRST-LEVEL DEGREES BY FIELD

In 1957–58, about one-fourth of all first-level degrees (bachelor's and first-professional degrees) were awarded in the fields of study constituting the natural sciences and related professions. The remaining three-fourths were awarded in the social sciences, humanities, and related professions. These proportions are expected to change little between 1957–58 and 1977–78. (See table 16.)

The total number of first-level degrees granted in the natural sciences rose from 105,000 in 1957–58 to an estimated 168,000 in 1967–68 and is expected to be 236,000 in 1977–78. First-level degrees granted in the social sciences, humanities, and related professions rose from 259,000 in 1957–58 to an estimated 517,000 in 1967–68, and are expected to total 744,000 in 1977–78.

The two fastest growing fields of study at the first level are mathematics including statistics, and foreign languages. The numbers of degrees in the field of agriculture and forestry are expected to decrease, while engineering and philosophy including religion show little change. All other fields show moderate to large increases. Dislocations between bachelor's and master's degrees in the fields of library science and social work caused by the change in definitions make the projections of first level degrees in these two fields unreliable.

TABLE 16.—*Earned bachelor's and 1st-professional degrees, by field of study: United States, 1957–58, 1967–68, and 1977–78*

Field of study	1957–58	1967–68 [1]	1977–78 [2]
Natural sciences and related professions	104,623	167,700	236,160
Mathematics and statistics [3]	6,905	28,900	64,690
Engineering	35,191	41,260	40,350
Physical sciences [4]	14,317	20,780	26,220
Biological sciences [5]	14,308	34,270	53,970
Agriculture and forestry	8,223	8,470	3,290
Health professions [6]	23,837	30,570	41,570
Science, general program	1,842	3,450	6,070
Social sciences, humanities, and related professions	258,879	516,810	743,740
Fine arts [7]	20,825	39,690	51,890
Philosophy and religion [8]	7,014	10,530	11,610
English and journalism	19,197	55,460	99,770
Foreign languages [9]	4,465	21,550	46,410
Psychology	6,867	22,400	39,760
Social sciences [10]	46,624	120,680	199,540
Education	65,060	116,950	157,050
Library science	[11] 1,690	920	1,890
Social work	[11] 1,979	2,430	5,540
Other [12]	85,158	126,200	130,280

[1] Estimated.

[2] The projection of degrees by subject field is based on the assumption that the percent distribution of degrees by field for each level and sex will continue the 1957–58 to 1965–66 trends.

[3] Includes mathematics, statistics, and computer science.

[4] Includes astronomy, chemistry, earth sciences, meteorology, physics, and other physical sciences.

[5] Includes anatomy, bacteriology, biochemistry, biology, botany, entomology, physiology, zoology, and other biological sciences.

[6] Includes dentistry, medicine and osteopathy, nursing, optometry, pharmacy, public health, veterinary medicine, and other health professions.

[7] Includes architecture, music, speech and dramatic arts, and other fine and applied arts.

[8] Includes philosophy, scholastic philosophy, religious education and Bible, and other religious fields.

[9] Includes classical languages, French, German, Russian, other Slavic languages, and other languages and language programs.

[10] Includes anthropology, economics, geography, history, international relations, political science, public administration, sociology, and other social sciences.

[11] Data not comparable with later years because of a change in method of reporting 1st-professional degrees.

[12] Includes business and commerce; home economics; law; military, naval, or Air Force science; theology; and miscellaneous and unclassified fields.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education publications: "Earned Degrees Conferred by Institutions of Higher Education," annually, 1957–58 through 1965–66.

SECOND-LEVEL DEGREES BY FIELD

The proportion of second-level degrees awarded in the natural sciences and related professions is expected to rise from one-fourth of all second-level degrees in 1957–58 to approximately one-third in 1977–78. Conversely, the proportion of these degrees awarded in the social sciences, humanities, and related professions is expected to drop from three-fourths in 1957–58 to two-thirds in 1977–78. (See table 17.)

The total number of second-level degrees awarded in the natural sciences and related professions rose from 15,000 in 1957–58 to an estimated 38,000 in 1967–68 and is expected to be 85,000 by 1977–78. Second-level degrees in the group of fields composed of the social sciences, humanities, and related professions rose from 50,000 in 1957–58 to an estimated 111,000 in 1967–68 and are expected to rise to 188,000 by 1977–78.

The two fastest growing fields at the second level are mathematics including statistics, and engineering, although all natural sciences except agriculture and forestry showed large increases. Large increases in the fields of library science and social work are attributable to the 1965–66 redefinition of first-professional degrees. This renders projections in these two fields, at this level, unreliable.

TABLE 17.—*Earned master's degrees (except 1st-professional), by field of study: United States, 1957–58, 1967–68, and 1977–78*

Field of study	1957–58	1967–68 [1]	1977–78 [2]
Natural sciences and related professions	15,267	37,630	85,300
Mathematics and statistics [3]	1,234	6,190	18,690
Engineering	5,788	15,510	36,860
Physical sciences [4]	3,030	5,340	10,050
Biological sciences [5]	1,852	4,630	9,650
Agriculture and forestry	1,480	1,890	830
Health professions [6]	1,660	3,000	5,140
Science, general program	223	1,070	4,080
Social sciences, humanities, and related professions	50,319	111,200	188,360
Fine arts [7]	4,158	8,630	14,140
Philosophy and religion [8]	792	1,360	1,190
English and journalism	2,532	7,670	17,990
Foreign languages [9]	1,041	4,330	11,050
Psychology	1,235	3,510	8,150
Social sciences [10]	5,219	14,390	32,190
Education	28,222	44,310	53,450
Library science	[11] 157	4,160	8,270
Social work	[11] 124	4,030	7,080
Other [12]	6,839	18,810	34,850

[1] Estimated.

[2] The projection of degrees by subject field is based on the assumption that the percent distribution of degrees by field for each level and sex will continue the 1957–58 to 1965–66 trends.

[3] Includes mathematics, statistics, and computer science.

[4] Includes astronomy, chemistry, earth sciences, meteorology, physics, and other physical sciences.

[5] Includes anatomy, bacteriology, biochemistry, biology, botany, entomology, physiology, zoology, and other biological sciences.

[6] Includes dentistry, medicine and osteopathy, nursing, optometry, pharmacy, public health, veterinary medicine, and other health professions.

[7] Includes architecture, music, speech and dramatic arts, and other fine and applied arts.

[8] Includes philosophy, scholastic philosophy, religious education and Bible, and other religious fields.

[9] Includes classical languages, French, German, Russian, other Slavic languages, and other languages and language programs.

[10] Includes anthropology, economics, geography, history, international relations, political science, public administration, sociology, and other social sciences.

[11] Data not comparable with later years because of a change in method of reporting 1st-professional degrees.

[12] Includes business and commerce; home economics; law; military, naval, or Air Force science; theology; and miscellaneous and unclassified fields.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education publications: "Earned Degrees Conferred by Institutions of Higher Education," annually, 1957–58 through 1965–66.

Master's degrees in education are expected to increase only moderately between 1967–68 and 1977–78. This is because the number of degrees in education does not reflect the total number of persons preparing to teach. Prospective teachers earning degrees with majors in subject fields such as mathematics, sciences, English, and history are included with the appropriate subject fields rather than in education. The actual number of prospective teachers with majors in subject fields has shown large increases recently.

DOCTOR'S DEGREES BY FIELD

One-half of all doctor's degrees awarded in 1957–58 were in the subject fields which make up the natural sciences and related professions. This proportion is expected to rise to 55 percent by 1977–78. The remaining doctor's degrees will be awarded in the group of subject fields included under the social sciences, humanities, and related professions. (See table 18.)

TABLE 18.—*Earned doctor's degrees (except 1st-professional), by field of study: United States, 1957–58, 1967–68, and 1977–78*

Field of study	1957–58	1967–68 [1]	1977–78 [2]
Natural sciences and related professions	4,174	11,340	24,32
Mathematics and statistics [3]	247	1,060	2,790
Engineering	647	3,120	8,960
Physical sciences [4]	1,655	3,630	6,490
Biological sciences [5]	1,125	2,520	4,620
Agriculture and forestry	353	720	1,150
Health professions [6]	147	270	260
Science, general program	0	20	50
Social sciences, humanities, and related professions	4,768	10,890	19,620
Fine arts [7]	292	720	1,450
Philosophy and religion [8]	222	430	710
English and journalism	335	870	1,750
Foreign languages [9]	224	620	1,110
Psychology	572	1,450	2,670
Social sciences [10]	1,144	2,590	4,760
Education	1,529	3,190	5,360
Library science	[11] 19	20	20
Social work	[11] 18	80	210
Other [12]	413	920	1,580

[1] Estimated.

[2] The projection of degrees by subject field is based on the assumption that the percent distribution of degrees by field for each level and sex will continue the 1957–58 to 1965–66 trends.

[3] Includes mathematics, statistics, and computer science.

[4] Includes astronomy, chemistry, earth sciences, meteorology, physics, and other physical sciences.

[5] Includes anatomy, bacteriology, biochemistry, biology, botany, entomology, physiology, zoology, and other biological sciences.

[6] Includes dentistry, medicine and osteopathy, nursing, optometry, pharmacy, public health, veterinary medicine, and other health professions.

[7] Includes architecture, music, speech and dramatic arts, and other fine and applied arts.

[8] Includes philosophy, scholastic philosophy, religious education and Bible, and other religious fields.

[9] Includes classical languages, French, German, Russian, other Slavic languages, and other languages and language programs.

[10] Includes anthropology, economics, geography, history, international relations, political science, public administration, sociology, and other social sciences.

[11] Data not comparable with later years because of a change in method of reporting 1st-professional degrees.

[12] Includes business and commerce; home economics; law; military, naval, or Air Force science; theology; and miscellaneous and unclassified fields.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education publications: "Earned Degrees Conferred by Institutions of Higher Education," annually, 1957–58 through 1965–66.

The total number of doctor's degrees granted in the natural sciences and related professions rose from 4,200 in 1957–58 to an estimated 11,300 in 1967–68 and is expected to be 24,300 in 1977–78. Doctor's degrees granted in the social sciences, humanities, and related professions rose from 4,800 in 1957–58 to an estimated 10,900 in 1967–68 and are expected to be 19,600 by 1977–78.

The two fastest growing subject fields at the doctoral level were engineering and mathematics including statistics. Health professions and library science were the only fields of study with no increase in doctor's degrees expected in 1977–78 over 1967–68.

IV. STAFFING

TOTAL INSTRUCTIONAL STAFF FOR RESIDENT DEGREE-CREDIT COURSES IN INSTITUTIONS OF HIGHER EDUCATION

The total full-time and part-time instructional staff for resident degree-credit courses in all institutions of higher education increased from 259,000 in 1957–58 to an estimated 478,000 in 1967–68, and is expected to be 665,000 in 1977–78. These figures include all full-time and part-time instructors and above, plus junior instructional staff employed for instruction in resident degree-credit courses. The junior instructional staff includes assistant instructors, teaching fellows, teaching assistants, and laboratory assistants. (See table 19.)

The data for these and other figures in this and the following sections are from biennial faculty reports from individual institutions of higher education for 1957–58 through 1963–64 and from preliminary results of the 1966 Higher Education General Information Survey.

TABLE 19.—*Full-time and part-time instructional staff for resident degree-credit courses in all institutions of higher education, by professional rank: United States, 1st term, 1957–58, 1967–68, and 1977–78*

Instructional staff	1957–58	1967–68 [1]	1977–78 [2]
Total for resident degree-credit courses	258,848	478,000	665,000
Instructor or above	224,930	406,000	565,000
Full time	153,150	271,000	378,000
Part time	71,780	135,000	187,000
Junior instructional staff	33,918	72,000	100,000

[1] Estimated.

[2] The projection of total full-time and part-time instructional staff for resident degree-credit courses was computed separately by institutional control and type categories as outlines in tables 22 to 25, footnote 3, and summed for all institutions. The projection of total instructional staff for resident degree-credit courses employed as full-time instructor or above, part-time instructor or above, and as junior instructor, is based on the percentage each was of total full-time and part-time instructional staff for resident degree-credit courses in 1963–64. These percentages were 57, 28, and 15, respectively, and are assumed to remain at the 1963–64 level to 1977–78.

Note: Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education, publications: "Faculty and Other Professional Staff in Institutions of Higher Education", biennially, 1st term 1957–58 to 1963–64.

They differ from data published last year[1] because they cover only the 50 States and the District of Columbia. (The outlying areas are excluded.)

The total full-time and part-time instructional staff for resident degree-credit courses was projected separately for public 4-year, public 2-year, private 4-year, and private 2-year institutions and summed to obtain the total for all institutions. The projections are based on the assumption that student-staff ratios in each institutional control and type category will continue to increase as they have in the past. To obtain the projections, projected enrollments in each of the institutional control and type categories were divided by the projected student-staff ratios in corresponding categories. The resulting projections by institutional control and type are shown along with projections of all professional staff.

FULL-TIME-EQUIVALENT INSTRUCTIONAL STAFF FOR RESIDENT DEGREE-CREDIT COURSES IN INSTITUTIONS OF HIGHER EDUCATION

Full-time-equivalent instructional staff for resident degree-credit courses in all institutions increased from 187,000 in 1957–58 to an estimated 339,000 in 1967–68 and is expected to rise to 472,000 in 1977–78. These figures include full-time staff and the full-time equivalent of part-time instructor or above, plus the full-time equivalent of junior instructional staff. In 1963–64, in all institutions, about 86 percent of the full-time-equivalent instructional staff members with the rank of instructor or above were employed on a full-time basis. (See table 20.)

TABLE 20.—*Full-time equivalent instructional staff for resident degree-credit courses in all institutions of higher education, by professional rank: United States, 1st term 1957–58, 1967–68, and 1977–78*

Full-time equivalent instructional staff	1957–58	1967–68 [1]	1977–78 [2]
Total for resident degree-credit courses	187,042	339,000	472,000
Instructor or above	176,042	316,000	440,000
Full-time	153,150	271,000	378,000
Full-time equivalent of part-time	22,892	44,000	62,000
Junior instructional staff	11,000	24,000	32,000

[1] Estimated.

[2] The projection of full-time equivalent of part-time instructional staff is based on the following assumptions: (1) Full-time equivalent of part-time instructor or above will remain constant to 1977–78 at the 1963–64 level of 33 percent; and (2) this percentage will apply to total junior instructional staff also and will remain constant to 1977–78.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education publications: "Faculty and Other Professional Staff in Institutions of Higher Education," biennially, 1st term 1957–58 to 1963–64.

TOTAL PROFESSIONAL STAFF IN INSTITUTIONS OF HIGHER EDUCATION

Total full-time and part-time professional staff in institutions of higher education is classified by primary function. The classification includes, in addition to staff for instruction in resident degree-credit courses, full-time and part-time instructional staff employed for extension courses, resident nondegree-credit courses, and instruction by mail, radio, or television. It also includes full-time and part-time professional staff employed for administration and services, and for organized research. Full-time and part-time professional staff in institutions of higher education rose from 381,000 in 1957–58 to an estimated 735,000 in 1967–68, and is expected to be 1,028,000 in 1977–78. (See table 21.)

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[1] "Projections of Educational Statistics to 1976–77" (1967 Edition), U.S. Department of Health, Education, and Welfare, Office of Education.

Projected full-time and part-time professional staff for all institutions is based on the assumption that full-time and part-time professional staff other than that for instruction in resident degree-credit courses, as a percentage of total full-time and part-time instructional staff for resident degree-credit courses, will maintain to 1977–78, the same relationship that existed in 1963–64. The percentages used for other instructional staff, for administration and services, and for organized research differed in each of the four types of institutions and are given in the footnotes to tables 22 to 25. These tables give projections of other instructional staff, administration and services, and organized research for the four types of institutions: public 4-year, public 2-year, private 4-year, and private 2-year institutions. (See tables 22, 23, 24, and 25.)

TABLE 21.—*Total full-time and part-time professional staff in all institutions of higher education, by primary function; United States, 1st term 1957–58, 1967–68, and 1977–78* [1]

Professional staff	1957–58	[2] 1967–68	[3] 1977–78
Total professional	381,066	735,000	1,028,000
Total instructional	311,164	572,000	805,000
Resident degree-credit courses [4]	258,848	478,000	665,000
Other courses [5]	52,316	95,000	141,000
Other professional	69,902	163,000	222,000
Administration and services [6]	37,760	77,000	106,000
Organized research [7]	32,142	86,000	116,000

[1] Excludes professional staff for instruction at the elementary and secondary school level.

[2] Estimated.

[3] The projection of total full-time and part-time instructional staff for resident degree-credit courses, instructional staff for other than degree-credit courses, professional staff for administration and services, and professional staff for organized research was computed separately by institutional control and type categories as outlined in tables 22 through 25, footnote 3, and summed for all institutions.

[4] Includes faculty with rank of instructor or above and junior instructional staff.

[5] Includes instructional staff for extension, resident nondegree-credit courses, and instruction by mail, radio, or TV, short courses, and individual lessons.

[6] Includes professional staff for general administration, student personnel services, and libraries.

[7] Includes only professional staff engaged specifically for full-time or part-time research and those who have been relieved from some or all other duties in order to perform systematic organized research. Excludes graduate students not performing research at a professional level and research consultants employed occasionally.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education [illegible] "Faculty and Other Professional Staff in Institutions of Higher Education," biennially, 1st term, [illegible] 1963–64.

TABLE 22.—*Total full-time and part-time professional staff in 4-year public institutions of higher education, by primary function: United States, 1st-term 1957–58, 1967–68, and 1977–78* [1]

Professional staff	1957–58	1967–68 [2]	1977–78 [3]
Total professional	183,339	376,000	542,000
Total instructional	150,890	294,000	424,000
Resident degree-credit courses	116,728	233,000	337,000
Other courses	34,162	61,000	88,000
Other professional	32,449	82,000	118,000
Administration and services	13,171	30,000	44,000
Organized research	19,278	51,000	74,000

[1] For exclusions and inclusions under the different categories of professional staff, see table 21, footnotes 1 and 4 through 7.

[2] Estimated.

[3] The projection of total full-time and part-time instructional staff for resident degree-credit courses in 4-year public institutions is based on the assumption that the ratio of total degree-credit enrollment to instructional staff for resident degree-credit courses in these institutions will follow the 1957–58 to 1963–64 trend. The projection of total full-time and part-time instructional staff for other than resident degree-credit courses, professional staff for administration and services, and professional staff for organized research, is based on the percentage each was of total full-time and part-time instructional staff for resident degree-credit courses in 1963–64. These percentages in 4-year public institutions were 26, 13, and 22, respectively, and are assumed to remain at the 1963–64 level to 1977–78.

NOTE. Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education, publications: "Faculty and Other Professional Staff in Institutions of Higher Education," biennially, 1st term 1957–58 to 1963–64.

TABLE 23.—*Total full-time and part-time professional staff in 4-year private institutions of higher education, by primary function: United States, 1st term, 1957–58, 1967–68, and 1977–78* [1]

Professional staff	1957–58	1967–68 [2]	1977–78 [3]
Total, professional	162,361	272,000	335,000
Total, instructional	129,834	202,000	248,000
Resident degree-credit courses	121,216	190,000	233,000
Other courses	8,618	12,000	15,000
Other professional	32,527	70,000	86,000
Administration and services	19,708	36,000	44,000
Organized research	12,819	34,000	42,000

[1] For exclusions and inclusions under the different categories of professional staff, see table 21, footnotes 1 and 4 through 9.

[2] Estimated.

[3] The projection of total full-time and part-time instructional staff for resident degree-credit courses in 4-year private institutions is based on the assumption that the ratio of total degree-credit enrollment to instructional staff for resident degree-credit courses in these institutions will follow the 1957–58 to 1963–64 trend.

The projection of total full-time and part-time instructional staff for other than resident degree-credit courses, professional staff for administration and services, and professional staff for organized research, is based on the percentage each was of total full-time and part-time instructional staff for resident degree-credit courses in 1963–64. These percentages in 4-year private institutions were 7, 19, and 18, respectively, and are assumed to remain at the 1963–64 level to 1977–78.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education publications: "Faculty and Other Professional Staff in Institutions of Higher Education," biennially, 1st term 1957–58 to 1963–64.

TABLE 24.—*Total full-time and part-time professional staff in 2-year public institutions of higher education, by primary function: United States, 1st-term, 1957–58, 1967–68, and 1977–78* [1]

Professional staff	1957–58	1967–68 [2]	1977–78 [3]
Total professional	25, 489	74, 000	134, 000
Total instructional	22, 921	66, 000	121, 000
Resident degree-credit courses	15, 244	47, 000	85, 000
Other courses	7, 677	19, 000	34, 000
Other professional	2, 568	7, 000	13, 000
Administration and services	2, 557	7, 000	13, 000
Organized research	11	(4)	(4)

[1] For exclusions and inclusions under the different categories of professional staff, see table 21, footnotes 1 and 4 through 7.

[2] Estimated.

[3] The projection of total full-time and part-time instructional staff for resident degree-credit courses in 2-year public institutions is based on the assumption that the ratio of total degree-credit enrollment to instructional staff for resident degree-credit courses in these institutions will follow the 1957–58 to 1963–64 trend.

The projection of total full-time and part-time instructional staff for other than resident degree-credit courses, professional staff for administration and services, and professional staff for organized research, is based on the percentage each was of total full-time and part-time instructional staff for resident degree-credit courses in 1963–64. These percentages in 2-year public institutions were 40, 15, and less than 1 percent, respectively, and are assumed to remain at the 1963–64 level to 1977–78.

[4] Less than 500.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education publications: "Faculty and Other Professional Staff in Institutions of Higher Education," biennially, 1st term 1957–58 to 1963–64.

TABLE 25.—*Total full-time and part-time professional staff in 2-year private institutions of higher education, by primary function: United States, 1st term, 1957–58, 1967–68, and 1977–78* [1]

Professional staff	1957–58	1967–68 [2]	1977–78 [3]
Total, professional	9, 877	14, 000	17, 000
Total, instructional	7, 519	10, 000	12, 000
Resident degree—credit courses	5, 660	7, 000	9, 000
Other courses	1, 859	3, 000	3, 000
Other professional	2, 358	4, 000	5, 000
Administration and services	2, 324	4, 000	5, 000
Organized research	34	(4)	(4)

[1] For exclusions and inclusions under the different categories of professional staff, see table 21, footnotes 1 and 4 through 7.

[2] Estimated.

[3] The projection of total full-time and part-time instructional staff for resident degree-credit courses in 2-year private institutions is based on the assumption that the ratio of total degree-credit enrollment to instructional staff for resident degree-credit courses in these institutions will follow the 1957–58 to 1963–64 trend.

The projection of total full-time and part-time instructional staff for other than resident degree-credit courses, professional staff for administration and services, and professional staff for organized research, is based on the percentage each was of total full-time and part-time instructional staff for resident degree-credit courses in 1963–64. These percentages in 2-year private institutions were 39, 55, and 1 percent, respectively, and are assumed to remain at the 1963–64 level to 1977–78.

[4] Less than 500.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education publications: "Faculty and Other Professional Staff in Institutions of Higher Education," biennially, 1st term, 1957–58 to 1963–64.

FULL-TIME-EQUIVALENT PROFESSIONAL STAFF IN INSTITUTIONS OF HIGHER EDUCATION

The estimated and projected full-time equivalent of total full-time and part-time professional staff in all institutions is shown in table 26. The method of estimating and projecting full-time equivalent instructional staff for resident degree-credit courses is given in the footnotes to table 20. The 1963–64 ratio of full-time equivalent instructional staff to total full-time and part-time instructional staff for resident degree-credit courses was 0.71. The totals for full-time and part-time staff employed for instruction in courses other than resident degree-credit courses, for administration and services, and for organized research shown in table 21, were multiplied by the above ratio to obtain the full-time equivalents for this staff given in table 26.

DEMAND FOR INSTRUCTIONAL STAFF IN INSTITUTIONS OF HIGHER EDUCATION

The demand for additional full-time-equivalent instructional staff in all institutions of higher education is expected to continue to increase during the next 10 years, 1968–69 through 1977–78. During the past 5 years, 1963–64 through 1967–68, the demand for additional full-time-equivalent instructional staff was 225,000. It is expected to be 211,000 in 1968–69 through 1972–73 and 243,000 in 1973–74 through 1977–78. These figures include the number needed for both increased enrollment and replacement of staff leaving the profession temporarily or permanently each year. The instructional staff includes those employed for extension courses, resident nondegree-credit courses, and instruction by mail, radio, or television, as well as the instructional staff for resident degree-credit courses.

TABLE 26.—*Estimated full-time equivalent professional staff in all institutions of higher education, by primary function; United States, 1st term, 1957–58, 1967–68, and 1977–78* [1]

Full-time equivalent professional staff	1957–58	1967–68 [2]	1977–78
Total professional	274,000	522,000	730,000
Total instructional	224,000	407,000	572,000
Resident degree—credit courses	187,000	339,000	472,000
Other courses	37,000	67,000	100,000
Total other professional	50,000	116,000	158,000
Administration and services	27,000	55,000	75,000
Organized research	23,000	61,000	83,000

[1] For the categories of professional staff members included in this table, see footnotes 1 and 4 through 7, table 21.

The estimation, 1957–58 to 1967–68 and the projection, 1968–69 to 1977–78 of the full-time equivalent of reported total full-time and part-time professional staff for instructional courses other than degree-credit, for administration and services, and for organized research, are based on the assumption that the percent that full-time equivalent instructional staff for resident degree-credit courses is of total full-time and part-time instructional staff for these courses (71 percent in 1963–64) will apply to all other professional staff as well. The totals of full-time and part-time staff shown in table 21 were multiplied by this percentage.

[2] Estimated.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education publications: "Faculty and Other Professional Staff in Institutions of Higher Education," biennially, 1st-term 1957–58 to 1963–64.

The projected demand for additional full-time-equivalent instructional staff is shown in the bottom three rows of table 27. It is based on the estimated and projected full-time-equivalent instructional staff, and is projected as the total of staff required for increased enrollment and for replacement of those who have left the profession either temporarily or permanently. Full-time equivalent staff required for increased enrollment is computed as the difference between the total number employed in successive years. The requirements for replacement are estimated at 6 percent of the total number employed in the previous year.

It should be noted that one of the basic assumptions underlying the demand for instructional staff shown here is that the student-staff ratios will continue to increase until 1977–78. Any reversal of this trend will result in larger demands for instructional staff than those presented here.

TABLE 27.—*Estimated demand for full-time equivalent instructional staff in all institutions of higher education, by primary function, United States, 1st term, 1963–68, 1968–73, and 1973–78* [1]

Demand for full-time equivalent instructional staff	1963–68	1968–73	1973–78
Total instructional staff	1,776,000	2,265,000	2,711,000
Resident degree-credit courses	1,489,000	1,882,000	2,242,000
Other courses	287,000	382,000	469,000
Additional instructional staff needed	225,000	211,000	243,000
For increased enrollment	126,000	[2] 80,000	[2] 86,000
For replacement	99,000	[2] 131,000	[2] 158,000

[1] For the categories of professional staff members included in this table, see footnotes 1 and 4 through 7, table 21. For method of estimating and projecting full-time equivalent instructional staff, see table 20, footnote 2, and table 26, footnote 1.

[2] The projection of additional full-time equivalent instructional staff for increased enrollment was computed as the difference between the total full-time equivalent instructional staff employed in 2 successive years. The projection of additional full-time equivalent instructional staff for replacement of those leaving the profession, temporarily or permanently, was estimated at 6 percent of the total full-time equivalent professional staff employed in the previous year.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education publications: "Faculty and Other Professional Staff in Institutions of Higher Education," biennially, 1st term, 1957–58 to 1963–64.

The assumption of a 6-percent replacement rate is based on unpublished data from a 1963 Office of Education study which showed that about 5 percent of the full-time instructors and above in 4-year institutions intended to leave employment in institutions of higher education during the following year. If we estimate an additional 1 percent for mortality, the annual replacement rate is then 6 percent. If the requirement for replacement should be lower or higher than the assumed 6 percent per year, the demand for replacement of instructional staff would be altered somewhat.

DEMAND FOR PROFESSIONAL STAFF IN INSTITUTIONS OF HIGHER EDUCATION

The professional staff in institutions of higher education includes in addition to instructional staff, staff employed for general administration and services and staff employed for organized research, as shown in tables 21 and 26. The demand for additional full-time-equivalent professional staff is expected to continue to increase during the next 10 years, 1968–69 through 1977–78. During the past 5 years, 1963–64 through 1967–68, the demand for additional full-time-equivalent professional staff was 296,000. It is expected to be 286,000 in 1968–69 through 1972–73 and 330,000 in 1973–74 through 1977–78. These figures include the number needed for both increased enrollment and replacement of staff leaving the profession. (See table 28.)

TABLE 28.—*Estimated demand for full-time equivalent professional staff in all institutions of higher education, by primary function: United States, 1st term, 1963–68, 1968–73, and 1973–78* [1]

Demand for full-time equivalent professional staff	1963–68	1968–73	1973–78 [2]
Total, professional staff needed	2,595,000	3,258,000	3,928,000
Total, instructional staff	2,299,000	2,972,000	3,598,000
Resident degree-credit courses	1,489,000	1,882,000	2,242,000
Other courses	287,000	382,000	469,000
Administration and services	243,000	303,000	357,000
Organized research	280,000	405,000	530,000
Additional professional staff needed	296,000	286,000	330,000
For increased enrollment	168,000	115,000	121,000
For replacement	128,000	171,000	209,000

[1] For the categories of professional staff members included in this table, see footnotes 1 and 4 through 7, table 21.

For the method of estimating and projecting full-time equivalents, see table 20, footnote 2, and table 26, footnote 1.

[2] The projection of additional full-time equivalent professional staff for increased enrollment was computed as the difference between the total full-time equivalent professional staff employed in 2 successive years.

The projection of additional full-time equivalent professional staff for replacement of those leaving the profession, temporarily or permanently, was estimated at 6 percent of the total full-time equivalent professional staff employed in the previous year.

NOTE.—Data are for 50 States and the District of Columbia for all years. Because of rounding, detail may not add to totals.

Sources: U.S. Department of Health, Education, and Welfare, Office of Education publications: "Faculty and Other Professional Staff in Institutions of Higher Education," biennially, 1st term, 1957–58 to 1963–64.

V. EXPENDITURES

The actual and projected full-time equivalent enrollments in institutions of higher education, as developed in the enrollment part of this paper, were used as one of the main data sources for projecting expenditures by institutions of higher education. The enrollments used were as follows:

[Numbers in thousands]

	Fall—		
	1957	1967	1977
Full-time equivalent enrollment in institutions of higher education:			
Public	1,458	3,766	6,189
Nonpublic	1,041	1,710	2,151
Total	2,499	5,476	8,340

The projections which follow were developed by the author and other members of the National Center for Educational Statistics, and all figures shown here are the ones shown in *Projections of Educational Statistics to 1977–78*. (See bibliography). They are used extensively by educational planners and researchers throughout the United States, and they reflect the results of many years of concentrated effort on the problem of providing reliable and coordinated projections of the main areas of educational statistics. They are, of course, subject to the same limitations and uses presented at the beginning of this paper.

This presentation includes, for each of the expediture items projected separately, a brief description of the methodology and the expenditure figures for 1957–58, 1967–68, and 1977–78. All figures are for the United States (50 States and D.C.), and are shown in both constant (1967–68) and current dollars. Conversion from current to constant dollars in the instance of current expenditures was on the basis of the Consumer Price Index prepared by the Bureau of Labor Statistics, U.S. Department of Labor. Index numbers were arranged on a July-June basis to correspond to the school years. Capital expenditures were converted from current to constant dollars on the basis of the American Appraisal Company Construction Cost Index. The projected current dollar figures for 1977–78 are based on the assumption that the Consumer Price Index will increase 20 percent and the American Appraisal Construction Cost Index will increase 30 percent above the 1967–68 level.

Most of the following projections are based on the assumption that the 1957–58 to 1967–68 trend will continue through 1977–78. Exceptions or additions to this assumption are included with the methodology.

IDENTIFICATION OF ESSENTIAL ELEMENTS

Expenditures for higher education are defined as all funds expended for capital outlay and current expenditures, including interest reported in current expenditures. Excluded are transfers of funds and repayments of debts that would result in duplication. Figures for public and nonpublic institutions are shown separately. Capital outlay is defined as expenditure which results in addition to the value of the physical plant.

PROJECTING CURRENT EXPENDITURES AND EXPENDITURES FROM CURRENT FUNDS BY INSTITUTIONS OF HIGHER EDUCATION

Annual current expenditures of institutions of higher education (in 1967–68 dollars) increased from $5.1 billion in 1957–58 to $15.3 billion in 1967–68, a threefold increase. They are expected to reach $27.8 billion by 1977–78, or nearly double during the projected 10-year period. The projected data are based largely upon expected increases in enrollment and upon the trend of increasing costs per student expressed in constant dollars. Thus, while enrollment is not expected to increase at as rapid a rate as during the past 10 years, this factor will be more than offset by increasing expenditures per student. The result is an expected or projected constant dollar increase of $12.5 billion over the next 10 years compared to a constant dollar increase of $10.2 billion over the past 10 years.

Methodology:

Current expenditures by institutions of higher education are not usually reported as such, and so they must be derived from accounts labeled "expenditures from current funds." These accounts are divided into four functional components: student education, related activities, organized research, and auxiliary enterprises and student aid. "Student education" encompasses general administration, instruction and departmental research, extension and public services, libraries, and operation and maintenance.

(a) Expenditures for student education were projected by use of the trend of annual expenditures per full-time equivalent student over the 10-year base period and in conjunction with the projected enrollment of such students. When expressed in terms of expenditures per full-time equivalent student (y), the equations are as follows:

[t=time in years, t=1 in 1957–58]

		Standard errors
Public	$y' = \$1{,}248.00 + \$18.00(t)$	\$16.06
Nonpublic	$y' = \$1{,}159.75 + \$69.75(t)$	28.74

NOTE.—The costs per student, as projected by the above formulas, were then multiplied by the projected numbers of full-time equivalent students to arrive at total expenditures from current funds for student education. (See table 29.)

TABLE 29.—*Expenditures from current funds for student education, by institutions of higher education—United States*

Item	1957–58 estimated	1967–68 estimated	1977–78 projected
All institutions:			
Cost per student (1967–68 dollars)	1,257	1,604	1,883
Total (in billions of 1967–68 dollars)	3.1	8.8	15.7
Total (in billions of current dollars)	2.6	8.8	18.8
Publicly controlled institutions:			
Cost per student (1967–68 dollars)	1,263	1,451	1,626
Total (in billions of 1967–68 dollars)	1.8	5.5	10.1
Total (in billions of current dollars)	1.5	5.5	12.1
Nonpublicly controlled institutions:			
Cost per student (1967–68 dollars)	1,249	1,942	2,624
Total (in billions of 1967–68 dollars)	1.3	3.3	5.6
Total (in billions of current dollars)	1.1	3.3	6.7

(b) The projection of expenditures for organized research, as a component of current expenditures, was done without regard to enrollment or to relationship with expenditures for student education. In view of the extremely variable nature of this component's relation to industry and education, we have projected on the basis of the constant dollar trend of expenditures for organized research during the base period. This projection may well be quite conservative, especially for the publicly controlled institutions which undoubtedly have the potential to engage in organized research to a far greater degree than performance over the past 10 years would indicate. (See table 30.)

In line with these assumptions, the following equations were developed:

[Organized research: y=total amounts in thousands of 1967–68 dollars; t=time in years, t=1 in 1957–58]

	Standard errors
Public $y' = \$350{,}607 + \$94{,}423(t)$	\$25,525
Nonpublic $y' = \$243{,}352 + \$125{,}740(t)$	48,341

TABLE 30.—*Expenditures from current funds for organized research by institutions of higher education: United States, 1957–58, 1967–68, and 1977–78*

	1957–58 estimated	1967–68 estimated	1977–78 Projected
Type of control of institutions of higher education:			
Public [1]	0.5	1.4	2.3
Nonpublic [1]	.4	1.7	2.9
Public [2]	.4	1.4	2.8
Nonpublic [2]	.3	1.7	3.5

[1] In billions of 1967–68 dollars.
[2] In billions of current dollars.

(c) Related activities, auxiliary enterprises, and student aid expenditures were projected on the basis of their percentage relationship to student education during the base period. These functions are obviously closely related to trends in enrollment, but allowance had to be made for the change during the base period in their percentage relationship to student education. The base period data indicate a trend toward slightly more emphasis on these activities. The exception is expenditures for auxiliary enterprises in non-publicly controlled institutions, which have decreased slightly during the base period in relation to student education. (See tables 31 and 32.)

Trend equations, based on 1957–58 to 1967–68 data, and the past and projected ratios for each item are shown below: (y=the expenditures from current funds for each item expressed as a percentage of the expenditure for student education, t=year, 1957–58=1).

Item by type of control of institution	Least squares equations	Standard errors
Related activities:		
Public	$y'=9.855+0.025(t)$	$0.079
Nonpublic	$y'=8.712+0.022(t)$	.127
Auxiliary enterprises:		
Public	$y'=26.367+0.147(t)$	.546
Nonpublic	$y'=33.254-0.206(t)$	.328
Student aid:		
Public	$y'=2.834+0.119(t)$	.01
Nonpublic	$y'=7.573+0.288(t)$	.173

TABLE 31.—*Expenditures for related activities, auxiliary enterprises, and student aid, as percentages of student education expenditures by institutions of higher education: United States, 1957–58, 1967–68, and 1977–78*

[In percent]

	1957–58 estimated	1967–68 estimated	1977–78 projected
Related activities:			
Public	9.83	10.09	10.38
Nonpublic	8.64	8.89	9.17
Auxiliary enterprises:			
Public	26.72	27.89	29.45
Nonpublic	33.29	31.07	28.93
Student aid:			
Public	2.95	4.14	5.33
Nonpublic	7.75	10.65	13.62

TABLE 32.—*Expenditures from current funds for related activities, auxiliary enterprises, and student aid by institutions of higher education: United States, 1957–58, 1967–68, and 1977–78*

Item	1957–58 estimated	1967–68 estimated	1977–78 projected
Related activities: [1]			
Total	0.3	0.8	1.5
Public	.2	.5	1.0
Nonpublic	.1	.3	.5
Auxiliary enterprises and student aid: [1]			
Total	1.0	3.2	5.9
Public	.5	1.8	3.5
Nonpublic	.5	1.4	2.4
Related activities: [2]			
Total	.3	.8	1.8
Public	.2	.5	1.2
Nonpublic	.1	.3	.6
Auxiliary enterprises and student aid: [2]			
Total	.8	3.2	7.1
Public	.4	1.8	4.2
Nonpublic	.4	1.4	2.9

[1] Amounts in billions of 1967–68 dollars.
[2] Amounts in billions of current dollars.

Expenditures for related activities are shown separately because they, together with those for student education and organized research, make up a total defined as "expenditures from current funds for educational and general purposes," a term used widely by the higher education community.

(d) The total expenditures from current funds were then projected by adding the components which were projected separately in a, b, and c, for each item: student education, organized research, related activities, auxiliary enterprises, and student aid. (See table 33.)

TABLE 33.—*Total expenditures from current funds by institutions of higher education: United States, 1957–58, 1967–68, and 1977–78*

Type of control of institution	1957–58 estimated	1967–68 estimated	1977–78 projected
All institutions [1]	$5.3	$15.9	$28.3
Public	3.0	9.2	16.9
Nonpublic	2.3	6.7	11.4
All institutions [2]	4.4	15.9	34.0
Public	2.5	9.2	20.3
Nonpublic	1.9	6.7	13.7

[1] Amounts in billions of 1967–68 dollars.
[2] Amounts in billions of current dollars.

(e) The expenditures from current funds shown above are essentially current expenditures with one exception. The exception is that they include some funds which were expended for capital outlay. An analysis of data on transfers from current funds to plant funds and direct expenditures from current funds for capital outlay showed that about 16 percent of the capital outlay was expended from current fund accounts. Therefore the figures in the above table are adjusted accordingly in order to show current expenditures only. (See table 34)

TABLE 34.—*Total current expenditures (including interest) by institutions of higher education: United States, 1957–58, 1967–68, and 1977–78*

Type of control of institution	1957–58 estimated	1967–68 estimated	1977–78 projected
All institutions [1]	5.1	15.3	27.8
Public	2.9	8.8	16.5
Nonpublic	2.2	6.5	11.3
All institutions [2]	4.2	15.3	33.4
Public	2.4	8.8	19.8
Nonpublic	1.8	6.5	13.6

[1] Amounts in billions of 1967–68 dollars.
[2] Amounts in billions of current dollars.

PROJECTED CAPITAL OUTLAY BY INSTITUTIONS OF HIGHER EDUCATION

Annual capital outlay of institutions of higher education (in 1967–68 dollars) increased from $1.6 billion during 1957–58 to an estimated $3.5 billion during 1967–68. Capital outlay over the entire 10-year base period of 1957–58 to 1967–68 amounted to an estimated total of $28.0 billion and is expected to reach a total of $28.2 billion over the 10-year projected period of 1967–68 to 1977–78.

Methodology:

Estimates of capital outlay were made on the basis of reported book value of plant at the beginning and end of each biennial reporting year and converted to 1967–68 dollars. An amount equal to 1 percent of the value of plant for each year was added as a conservative estimate of replacement and rehabilitation.

Projected capital outlay was based primarily on actual or expected increases in enrollment plus estimated expenditures for replacement and rehabilitation. This is not as straightforward a concept as it may seem. The historical data showed clearly that capital outlay cannot be related to increased enrollment on an annual basis. The shortest reasonably reliable period of time proved to be 5 years. An annual figure can be interpolated by utilizing a moving average of enrollment increases. We would emphasize, then, that the annual capital outlay projections should be regarded as interpolations.

The average amount of capital outlay per additional full-time equivalent student during the base years (1957–58 to 1967–68) was $7,545 for public and $14,431 for nonpublic institutions. These figures were multiplied by the enrollment increases that had been projected to 1977–78. These projected amounts were increased by 1 percent of the closing value of plant each year in order to reflect replacement and rehabilitation. (See table 35.)

TABLE 35.—*Capital outlay by institutions of higher education: United States, 1957–58, 1967–68, and 1977–78*

Item	1957–58 estimated	1967–68 estimated	1977–78 projected
Total [1]	$1.6	$3.5	$2.5
Public	1.0	2.4	1.9
Nonpublic	.6	1.1	.6
Total [2]	1.2	3.5	3.3
Public	.8	2.4	2.5
Nonpublic	.4	1.1	.8

[1] In billions of 1967–68 dollars.
[2] In billions of current dollars.

PROJECTING TOTAL EXPENDITURES OF HIGHER EDUCATIONAL INSTITUTIONS

The past and projected expenditures of higher educational institutions in the United States, according to the preceding methodology, are shown in table 36.

TABLE 36.—*Total expenditures by institutions of higher education, by instructional level and institutional control: United States, 1957–58, 1967–68, and 1977–78*

Type of control and type of expenditure—Higher education	1957–58 actual	1967–68 estimated	1977–78 projected
Amounts in billions of 1967–68 dollars:			
Total	$6.7	$18.8	$30.3
Public	3.9	11.2	18.4
Nonpublic	2.8	7.6	11.9
Current expenditures, including interest:			
Total	5.1	15.3	27.8
Public	2.9	8.8	16.5
Nonpublic	2.2	6.5	11.3
Capital outlay:			
Total	1.6	3.5	2.5
Public	1.0	2.4	1.9
Nonpublic	.6	1.1	.6
Amounts in billions of current dollars:			
Total	5.3	18.8	36.7
Public	3.1	11.2	22.3
Nonpublic	2.2	7.6	14.4
Current expenditures, including interest:			
Total	4.2	15.3	33.4
Public	2.4	8.8	19.8
Nonpublic	1.8	6.5	13.6
Capital outlay:			
Total	1.1	3.5	3.3
Public	.7	2.4	2.5
Nonpublic	.4	1.1	.8

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APPENDIX

TABLE A.—*School-age population—United States* [1]

Year (fall) (1)	Ages as of Oct. 1 (in thousands)					
	17		18		81 to 21	
	Men (2)	Women (3)	Men (4)	Women (5)	Men (6)	Women (7)
Estimated:						
1957	1,172	1,154	1,152	1,130	4,409	4,381
1958	1,240	1,218	1,180	1,158	4,508	4,471
1959	1,351	1,322	1,251	1,224	4,668	4,612
1960	1,462	1,428	1,360	1,329	4,897	4,827
1961	1,401	1,368	1,464	1,433	5,234	5,145
1962	1,406	1,370	1,404	1,372	5,480	5,377
1963	1,524	1,484	1,409	1,374	5,652	5,543
1964	1,869	1,812	1,526	1,488	5,817	5,702
1965	1,790	1,732	1,871	1,815	6,221	6,078
1966	1,786	1,732	1,793	1,737	6,612	6,447
1967	1,792	1,734	1,789	1,736	6,993	6,810
Projected:						
1968	1,843	1,785	1,794	1,739	7,259	7,062
1969	1,898	1,838	1,845	1,790	7,234	7,036
1970	1,959	1,903	1,900	1,842	7,341	7,140
1971	2,002	1,945	1,961	1,908	7,513	7,314
1972	2,048	1,983	2,004	1,949	7,722	7,524
1973	2,070	2,008	2,050	1,988	7,927	7,720
1974	2,114	2,052	2,072	2,013	8,098	7,890
1975	2,124	2,062	2,116	2,057	8,252	8,041
1976	2,130	2,071	2,126	2,066	8,375	8,158
1977	2,153	2,085	2,132	2,075	8,457	8,245

[1] Office of Education estimates are based on published and unpublished Bureau of the Census population data by age as of July 1. Population data used are consistent with series C projection data in U.S. Department of Commerce, Bureau of the Census "Current Population Reports: Population Estimates, Summary of Demographic Projections," series P–25, No. 388, Mar. 14, 1968.

Academic Labor Market Projections and the Draft

Allan M. Cartter **and** ***Robert L. Farrell****

PRECIS

As recently as five years ago educators, Federal agencies, and other knowledgeable observers looked forward with great trepidation to a forecasted deterioration of educational quality in the nation's colleges and universities. A desperate shortage of adequately trained teachers was anticipated as far ahead as one could see. A U.S. Commissioner of Education viewed the nation as standing "virtually paralyzed before a national problem of . . . fundamental significance." A university president predicted that teacher scarcity would become "a major national scandal" by 1970. A veteran dean demanded "heroic efforts" to forestall "a disastrous shortage." From the perspective of 1955, 1960, or 1965 the common view was that the situation was progressively worsening.

Today it is apparent that the nation's institutions of higher learning have never had stronger faculties, and the situation has in fact constantly improved since the mid-1950's. Part of the error in our past judgements was due to the effective manner in which the Federal government has supported the expansion of graduate education, most particularly in the sciences. A much larger part of the error, however, was due to the imperfect data available concerning higher education and the inadequate models used to predict future manpower requirements.

We can look forward to the 1970's with confidence that there will be an adequate supply of available manpower to meet most critical needs in teaching, research and other specialized employment fields. Whereas for the last decade we have needed to channel about half of all persons receiving the doctorate into college teaching to maintain the quality of our staffs, in the 1970's less than a third will be required, and fifteen years from now it may require only one in five.

The impact of the draft upon the future supply of scholarly manpower is likely to be relatively minor in relation to then current needs. A diversion of the magnitude now expected under Selective Service regulations would have had a disastrous impact had it occurred in the 1960–68 period; current draft calls, which will have their primary impact on doctorates awarded in 1971–75, can be absorbed without creating critical shortages at a time when the demand for new college teachers will have levelled off.

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Federal support will be required less in the future to stimulate students to attend graduate school; but even more support will be needed to help meet the high and rising costs of graduate education borne by a relatively small number of institutions. Ten years ago the critical need in graduate education was for fellowship and research support; today, and in the decade ahead, the great need is for an equitable sharing among public and private agencies of the high costs of educating the nation's specialized manpower.

A REVIEW OF THE RECENT PAST

The view that a dire calamity faced higher education in the immediate future was a common one until just a few years ago. Federal agencies and educational spokesmen, for more than a decade, testified to this end before Congressional Committees. The President's Committee on Education Beyond the High School, reporting in 1957, expected 4 or 5 teacher openings for every Ph. D. available "between now and 1970." The Commission on National Goals in 1961 foresaw an equally dim future. The O.E.C.D., in its review of American education and manpower resources, chastised this country for an irresponsibly low level of effort in training young men and women at the doctoral level. The Ford Foundation, in two reports in the 1950's, supported by the leading graduate deans in the country, predicted a frightening gap between national needs and the supply of new doctorates.

The pessimistic (and, as it has turned out, very misleading) view of the college teaching scene prevalent in the 1954–64 period was largely attributable to the biennial surveys of teacher supply and demand conducted by the N.E.A. while their collection of information was commendable, quite erroneous conclusions were drawn from the data. In their last report in 1963, they concluded that institutions of higher education were "unable to compete in the open market for the new talent being produced," and that national "complacence—almost outright indifference—is much in evidence" so that "colleges and universities find themselves more embarrassed day by day." [1]

The N.E.A. had constructed a rough projections model in 1959 that, quite understandably in light of the assumptions built into it, predicted an increasing shortage of college teachers with each passing year. This model was later used by the Office of Education, and led them to the unwarranted conclusion that the nation would have a cumulative deficit of some 125,000 Ph.D.'s by 1974.

In reviewing the past decade, however, one should be less critical of the construction of models for projection, even faulty ones, than of the fact that those who constructed the models never tested them by applying them to the known recent past.

The present authors attempted that in 1964, and thus opened up a controversial debate for the next several years. Our earlier efforts to improve the projections model, now viewed with the advantage of five years hindsight, have been proved relatively accurate. A reasonably good check against the predictions of such a model is provided every four years by the comprehensive data collected by the American Council on Education for successive editions of *American Universities and Colleges*. We have just completed an analysis of this data, reported on below, which reconfirms the modestly optimistic view provided by the projections model.

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[1] Ray C. Maul, *Teacher Supply and Demand in Universities, Colleges, and Junior Colleges, 1961–62 and 1962–63*, N.E.A. Research Report 1963-R9 (Washington: National Education Association, 1963).

THE PROJECTIONS MODEL

The model we have used to project likely future manpower needs and resources have been more fully described in earlier technical papers.[2] Basically it extrapolates from the experience of the recent past as to the employment preferences of those receiving the doctoral degree. Requirements for new faculty are based on mortality and retirement rates calculated from 1960 Census data, and on projected enrollment changes directly affecting the number of new teachers that must be added to faculties each year. The flow of senior doctorate holders between higher education and other employment sectors is based on recorded experience, gleaned from several N.S.F. and O.E. studies. In the absence of improved data concerning the operation of the academic labor market, the only realistic test of such a projections model is to cast it against the recent past. Insofar as such a test validates predictions of the future, we believe that we are on reasonably safe ground in our estimates below.

Before reviewing our most recent projections, we would enter one qualification. Some critics of our earlier papers have not been inclined to believe that the past is a good predictor of the future. On purely logical grounds we are in agreement. There is no magic in the assumption that approximately half of all new Ph.D.'s will be available for college teaching—*except that* there has been a surprisingly consistent percentage of new Ph.D.'s who have in fact entered college teaching over the last fifteen years, and this proportion has varied only one or two percentage points. Similarly, there is no particular logic in assuming that the flow of senior doctorate holders into and out of higher education will approximately cancel out each year—*except that* this fits the experience of the recent past, and the major source of error in all the earlier models was precisely because their authors posited their own seemingly reasonable (but unfortunately erroneous) assumptions.

We would therefore caution the reader that while we have a high degree of confidence in the estimates for the next five to seven years, we offer the projections beyond that period with less certainty. The constancy of several of the coefficients over the past decade has partly resulted from the fact that the market was reasonably in balance and relative salaries in teaching and other professions maintained their parity. If our projections are correct, this situation may not continue for long. It should also be obvious that these coefficients are not independent of each other—for example, a dire shortage in teaching would simultaneously tend to raise academic salaries, draw more new doctorates into teaching, draw senior doctorates from government and industry, and postpone retirements. If there should be marked changes in the relevant economic factors—most particularly student support and teaching salaries—one should expect corresponding changes in teacher supply and demand components.

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[2] See "A New Look at the Supply of College Teachers," *Educational Record*, Summer 1965, pp. 267–77; "The Supply and Demand of College Teachers," *American Statistical Association 1965 Social Statistics Proceedings*, pp. 70–80, reprint in the *Journal of Human Resources* I:1 (Spring 1966); "Future Faculty Needs and Resources" In Calvin Lee (ed.), *Improving College Teaching* (Washington, D.C., American Council on Education, 1966).

SUPPLY DETERMINANTS

Projections of doctoral output have been consistently low over the years. In 1955 the Office of Education, the Ford Foundation and the Commission on Human Resources each projected ahead fifteen years; actual degrees awarded today are about 125% higher than their predictions. Federal agencies and private groups have both proven to be poor and consistently conservative prognosticators.

The authors do not claim any special talent for gazing into the future concerning Ph.D. output. Our original projections, which some critics thought were optimistic four years ago, have also proven to be too low. The series we developed in 1965 was based not only on recorded experience of the earlier decade but also on trends in baccalaureate degrees, the changing pattern of entrance to graduate study, and the student's changes for eventual success in obtaining the Ph.D. We have now updated our projections, which appear, along with the most recent Office of Education series, in Table I. We have a reasonable degree of confidence in our series for the next six to eight years. Beyond 1977 or so, the influence of a number of factors currently at work makes prediction increasingly hazardous. For example, if the faculty demand situation eases in the mid to late seventies, as we predict, this may set in motion other pressures which might dampen the rising trend in doctoral output portrayed for the eighties.

A second factor affecting supply is how the newly trained Ph.D. views the attractions of a career in college teaching. One of the more reliable series of data contained in the National Education Association's publication dealing with faculty supply indicates that there has been surprising stability in the proportion of new Ph.D. graduates entering or continuing in college teaching. The Association's biennial surveys show that this proportion has fluctuated between forty-five and fifty percent since about 1955. In the model constructed here, it is assumed that approximately fifty percent of new Ph.D.'s will continue to make themselves available for the teaching needs of colleges and universities.

DEMAND DETERMINANTS

The model contains two assumptions concerning factors affecting the future demand for quality faculty. The first deals with the replacement of faculty necessary to offset deaths, retirements, and any possible net transfer out of academic employment which may occur. The second is concerned with the ratio of students to teaching staff.

There is still some dispute concerning the net flow of people into or out of college teaching. In the model we assume that a replacement rate of two percent per year is sufficient to take care of deaths, retirements, and perhaps a small net loss of people with doctorates to nonacademic employment sectors. Our earlier investigations showed that during the decade 1954–64 the combined death and retirement rate was approximately 1.81 percent per year.[3] With the rapid expansion of higher education the average age of professors would be expected to decrease, thus, if anything, slightly decreasing this replacement rate.

TABLE I.—*Doctorates awarded and projected to 1986*

Year	Actual	Projections		
		OE (1967)	OE (1969)	Cartter-Farrell
1957–58	8,942			
1958–59	9,360			
1959–60	9,829			
1960–61	10,575			
1961–62	11,622			
1962–63	12,822			
1963–64	14,490			
1964–65	16,467			
1965–66	18,237	17,500		
1966–67	20,621	18,800	19,800	20,600
1967–68		21,000	22,200	22,600
1968–69		23,600	25,100	24,500
1969–70		24,800	26,500	26,400
1970–71		24,900	27,000	28,200
1971–72		26,800	29,200	31,100
1972–73		32,000	34,900	32,700
1973–74		35,500	38,900	34,800
1974–75		35,800	39,300	36,900
1975–76		36,900	40,600	39,100
1976–77		38,700	42,000	41,600
1977–78			43,900	44,800
1978–79				47,200
1979–80				49,100
1980–81				50,900
1981–82				52,700
1982–83				54,600
1983–84				56,200
1984–85				57,700
1985–86				59,200

In a survey of National Register data in 1965, N.S.F. investigators showed that there actually might have been a slight net inflow to the higher educational sector of senior science doctorate holders from nonacademic employment.[4] Since faculty salaries and the status of the profession have continued to improve relative to most other occupations, there is reason to suspect that the system may be experiencing continuing modest net gains. Our choice of a 2 percent replacement rate, therefore, is a conservative assumption, probably overstating the annual demand for doctorate-holding faculty by about 500–750 annually. The most recent National Science Foundation survey of science faculty also used a 2 percent replacement rate.[5] If our predicted academic market situation materializes in the late 1970's, then teaching salaries might lose ground relative to nonacademic salaries, thus reversing the flow of senior scholars and perhaps raising the actual replacement rate above the 2 percent level.

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[3] This is the average rate. The rate varied from a low of .4 percent in biochemistry to 4.4 percent in the classics because of the age distribution of faculty in various disciplines. See "A New Look," *op. cit.*

[4] Bolt, Kolton, Levine, "Doctorate Feedback into Higher Education," *Science*, May 14, 1965, pp. 918–28.

The other major factor affecting the demand for new faculty is the expansion in college enrollments. How many new faculty are required to meet this expansion is determined by the prevailing student/teacher ratio. The average ratio for the higher education sector has risen from about 13.0 : 1 ten years ago to 15.6 : 1 today. This upward drift has occurred because the incremental ratio has remained fairly constant at nearly 20 : 1. Some observers have questioned whether this trend may not represent a deterioration of educational quality, implying as it does larger class sizes.

We have constructed our model assuming a continuance of the incremental ratio at nearly 20 : 1.[6] A careful review of experience since World War II indicates that the rising average student/staff ratio has not occurred because of deterioration at specific colleges, or even broad categories of institutions. Rather the entire "mix" of higher education has steadily changed. Junior colleges commonly have student/staff ratios of 25 : 1 or more, and four year state colleges average close to 20 : 1. Thus as these two types of institutions expand relative to the private liberal arts colleges and universities, it is natural that the overall average will rise. We view this as an expected, and healthy, indication that higher education is effectively performing its differentiated functions.

In an effort to portray what might happen to the quality of teaching faculty in all institutions over the next decade or so under the above assumptions, we have constructed two alternative paths of development in Table II. The first, which we label as the "maintenance of quality" model, illustrates the required number of new faculty with the doctorate if the objective is to maintain the present percentage of doctorates on teaching faculties. This proportion currently approximates 44 percent. (At the present time slightly over 50 percent of the faculty in 4-year colleges and universities and about 18 percent of the faculty in 2-year colleges are assumed to have the doctorate.[7]) The second path assumes that the academic community will not be content with present quality levels, and illustrates what would occur if the proportion of staff holding the doctorate increased by one percentage point per year. This provides two guidelines against which to measure the present and future availability of doctorates for college teaching.

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[5] *Science and Engineering Staff in Universities and Colleges* (Washington, National Science Foundation, 1967), Appendix F.

[6] The actual figure is 19.5 :1 when measuring both students and faculty in full-time equivalents. In the tables below we have concentrated our attention on full-time faculty, since most measures of quality faculty deal only with full-time staff. Full-time faculty constitute nearly 80 percent of f.t.e. teaching staffs. Thus the f.t.e. student/full-time faculty ratio used to project future needs is 25 :1. If the model had been cast in terms of f.t.e. faculty, the percentage of doctorates who enter teaching (full or part-time) would be higher and the percentage of faculty with the doctorate necessary to maintain quality (as indicated in Table II) would be lower. The net effect would be approximately the same as that shown in our market estimates below.

[7] See "Future Faculty Needs," *op. cit.*

THE COMPOSITE SUPPLY AND DEMAND PICTURE

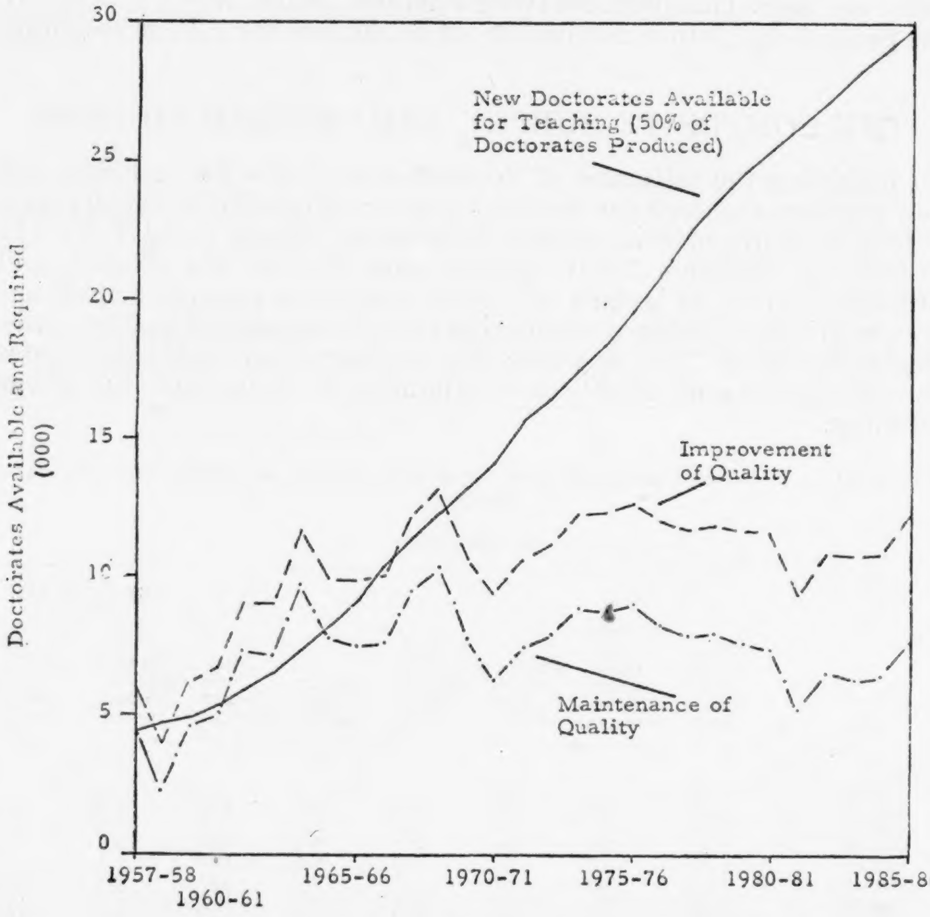
Combining the estimates of doctorates available for teaching and new teachers required for the maintenance of quality of faculty provides a view of potential market imbalances. Figure I and Table III provide an overview for the period from 1957 to the present, and projected to 1985. It is clear that in the immediate past the market has been relatively in balance considering the maintenance of quality needs. Beginning about 1970, however, the number of available doctorates should begin to considerably exceed the annual requirements for college teaching.

TABLE II.—*Actual and projected need for new doctorates in college, and university teaching*

[In thousands]

Year	F.t.e. degree credit enrollment	Enrollment increments (2-year average)	Number of full-time faculty	Full-time faculty increments	Faculty replacements	Total new faculty required	New faculty with doctorate	
							(A) Maintenance of quality model	(B) Improving quality model
Actual:								
1957-58	2,465		153					
1958-59	2,624	120	160	7.0	3.2	10.2	4.4	5.9
1959-60	2,739	137	162	2.0	3.2	5.2	2.3	3.9
1960-61	2,913	145	169	7.0	3.4	10.4	4.6	6.3
1961-62	3,173	117	177	8.0	3.5	11.5	5.1	6.8
1962-63	3,411	249	190	13.0	3.8	16.8	7.4	9.2
1963-64	3,639	233	202	12.0	4.0	16.0	7.0	9.1
1964-65	4,030	310	220	18.0	4.4	22.4	9.9	12.0
1965-66	4,564	463	243	13.0	4.9	17.9	7.9	10.3
1966-67	4,936	453	255	12.0	5.1	17.1	7.4	9.9
1967-68	5,380	408	271	16.3	5.4	21.7	9.5	12.2
Projected:								
1968-69	5,821	443	289	17.7	5.8	23.5	10.3	13.2
1969-70	5,954	287	301	11.5	6.0	17.5	7.7	10.7
1970-71	6,209	194	308	7.8	6.2	14.0	6.2	9.3
1971-72	6,458	252	318	10.1	6.4	16.5	7.3	10.5
1972-73	6,776	284	330	11.1	6.6	17.7	7.8	11.1
1973-74	7,106	324	343	13.0	6.9	19.9	8.8	12.2
1974-75	7,410	317	356	12.7	7.1	19.8	8.7	12.3
1975-76	7,751	323	368	12.9	7.4	20.3	8.9	12.6
1976-77	7,964	277	380	11.1	7.6	18.7	8.2	12.0
1977-78	8,200	250	390	10.0	7.8	17.8	7.8	11.7
1978-79	8,416	251	400	10.0	8.0	18.0	7.9	11.9
1979-80	8,645	223	408	8.9	8.2	17.1	7.5	11.6
1980-81	8,843	214	417	8.6	8.3	16.9	7.4	11.6
1981-82	8,985	170	424	6.8	8.5	15.3	6.7	10.9
1982-83	9,152	155	430	6.2	8.6	14.8	6.5	10.8
1983-84	9,267	141	436	5.6	8.7	14.3	6.3	10.7
1984-85	9,444	146	441	5.8	8.8	14.6	6.4	10.8
1985-86	9,690	212	450	8.5	9.0	17.5	7.7	12.3

Figure I--New Doctorates Available and Required:
Constant Quality and Rising Quality Models,
1957-58 through 1985-86



The "improvement of quality" curve in Figure I illustrates annual needs if the overall quality were to be improved each year by an additional percentage point of faculty with the doctorate. Evidence of the 1953–64 period indicates this as a reasonable goal to aspire to in times of supply availability. From 1970 onward, however, available doctorates promise to far outstrip even this rising quality demand for faculty. It should be pointed out that this improvement model is close to the maximum potential yearly market for doctorates in teaching unless there should be a marked downward shift in the student/staff ratio. The improvement of quality model would require that nearly two-thirds of new teachers each year already possess the doctorate. Even the most prestigious universities seldom surpass this level today, for

TABLE III.—*Actual and projected doctoral supply and demand*

Year	New doctorates available for teaching	New doctorates required for— Maintenance of quality	New doctorates required for— Improvement of quality
Actual:			
1958–59	4,680	4,400	5,900
1959–60	4,915	2,300	3,900
1960–61	5,288	4,600	6,300
1961–62	5,811	5,100	6,800
1962–63	6,411	7,400	9,200
1963–64	7,245	7,000	9,100
1964–65	8,234	9,900	12,000
1965–66	9,120	7,900	10,300
1966–67	10,311	7,400	9,900
1967–68	11,300	9,500	12,200
Projected:			
1968–69	12,250	10,300	13,200
1969–70	13,200	7,700	10,700
1970–71	14,100	6,200	9,300
1971–72	15,550	7,300	10,500
1972–73	16,350	7,800	11,100
1973–74	17,400	8,800	12,200
1974–75	18,450	8,700	12,300
1975–76	19,550	8,900	12,600
1976–77	20,800	8,200	12,000
1977–78	22,400	7,800	11,700
1978–79	23,600	7,900	11,900
1979–80	24,550	7,500	11,600
1980–81	25,450	7,400	11,600
1981–82	26,350	6,700	10,900
1982–83	27,300	6,500	10,800
1983–84	28,100	6,300	10,700
1984–85	28,850	6,400	10,800
1985–86	29,600	7,700	12,200

many new staff members are hired fresh from graduate school prior to the receipt of their degree, and in many fields (e.g. drama, law, music) the doctorate is not the expected highest degree.

Another way of viewing the potential supply and demand of new faculty which eliminates the need for assuming that some fixed percentage of new doctorate holders are "available" for teaching each year, is shown in Table IV.

Since, over the last fifteen years approximately 50 percent of new doctorates have entered teaching, we can interpret the figures in Table IV to mean that wherever the recorded percentage is fifty or less, the required number of new teachers is likely to be obtained. In some recent years—for example 1961 and 1963—over 60 percent of all new doctorates would have had to enter teaching merely to maintain the previously existing quality of staff. This percentage, judging by the experience of the last decade, was unobtainable, and accordingly we can assume that there was some modest deterioration in quality of faculty in those years. By contrast, in the current year (1969) it should be possible to improve quality substantially without using more than 50 percent of the available supply of new Ph.D.'s. In 1970, for the first time in many years, it is likely that the upper limit will be reached with less than 40 percent of Ph.D.'s entering teaching.

TABLE IV.—*New teachers with the doctorate required annually, as a percentage of annual doctorates awarded—3 models*

	I	II	III
Year (fall term)	Maintenance of quality (percent)	Improvement of quality (percent)	Upper limit with fixed student/staff ratios [1] (percent)
1957	49	66	80
1958	24	41	48
1959	46	62	72
1960	47	63	75
1961	63	78	100
1962	55	70	87
1963	67	81	106
1964	47	60	74
1965	41	54	65
1966	36	49	58
1967	42	54	67
1968	42	54	67
1969	29	41	47
1970	22	33	35
1971	23	34	37
1972	24	34	38
1973	25	35	40
1974	24	33	38
1975	23	32	36
1976	20	29	31
1977	17	26	28
1978	17	25	27
1979	15	24	24
1980	15	23	23
1981	10	18	20
1982	12	20	19
1983	11	19	18
1984	11	19	18
1985	13	21	21

[1] The upper limit is assumed to be 70 percent of new teachers hired annually. Above that level new doctorates can only be hired by displacing senior faculty. If, however, the student/staff ratio should be reduced the upper limit would rise. It should be noted, however, that any reduction in the student/staff ratio raises the direct instructional cost per student.

It is possible that it will take another year or two before the impact of this shift in the balance of supply and demand will be fully felt, particularly in light of the extraordinary efforts of the immediate period to bring into higher education many thousands of youth from disadvantaged backgrounds who, had the pattern of the last decade continued, would not ordinarily have sought a college education.

The special effort to enroll disadvantaged students will have a major effect on the demand for teachers in a few narrowly specialized fields—e.g. African history, "black" literature—but the overall effect on the academic labor market does not promise to be substantial. In 1969 there will be probably less than 200,000 non-white high school graduates in the nation, of whom ordinarily about 60,000 to 70,000 would have gone on to college. Even if the fraction of non-white high school graduates entering college were to immediately jump up to the level of whites continuing their education, this would add only about 50,000 to 60,000 students to college enrollment annually. This would represent an additional demand of about 1,000 teachers with the doctorate each year, a number easily supplied from the pool of available doctorates in future years.

Most of the errors of the past in estimating future supply and demand conditions arose because there were no reliable periodic checks of the actual composition of teaching faculties. The only fairly complete surveys were onetime efforts undertaken by the N.E.A. in 1953 and by the Office of Education in 1963. Table V summarizes these findings with respect to full-time faculty only.

Table V.—*Percentage of full-time instructional staff with doctoral degrees, 1953–54 and 1962–63*

Category of institution	1953–54 (NEA)	1962-63 (OE)
Public universities	44.0	58.4
Private universities	51.9	59.6
Public colleges	30.7	42.6
Private colleges	35.2	42.7
All institutions	40.5	50.6

Sources: 1953–54; *Teacher Supply and Demand in Degree Granting Institutions, 1954–55*, NEA Research Bulletin (Washington: National Education Association, December 1955), p. 138.

1962–63; *Teaching Faculty in Universities and 4-year Colleges, Spring 1963* (Washington: U.S. Office of Education, 1966), p. 5.

The authors compiled another series from data collected by the American Council on Education through 1962–63, and we have now brought that up to date with comparable data for 1966–67. Table VI presents this material. This series has both advantages and disadvantages. Its primary strength is that it provides four year benchmarks over a sixteen year period, thus adding weight to the view that the quality of teaching faculty has consistently improved over the years. On the debit side are two factors. First, it is a measure including all faculty, full-time and part-time. Thus the percentage of doctorate holders is lower than in the N.E.A. and O.E. surveys. The two sets of data are therefore not comparable, although they complement one another by showing the direction and relative magnitude of change. Second, and perhaps more important, the A.C.E. data shows changes for a stable sample of institutions. While the size of the sample is sufficiently large (about two-thirds of all senior institutions), it does not reflect the changing mix of institutions within the four subcategories. We believe, however, that even allowing for these problems, the data in Table VI corroborates the model we have used, and lends further support to the projections for the immediate future.

Table VI.—*Percentage of faculty with doctoral degree, private and public colleges and universities*

	Private	Public
Colleges:		
1950–51	29.7	23.2
1954–55	32.5	30.1
1958–59	33.7	32.0
1962–63	35.4	33.5
1966–67	37.5	34.7
Universities:		
1950–51	37.3	36.0
1954–55	40.0	40.7
1958–59	40.7	41.7
1962–63	43.8	44.9
1966–67	45.6	48.4

It would be a relatively simple task for the Office of Education to collect such data on an annual and biennial basis. On an issue of public policy as important as the adequacy of the supply of teachers, and particularly when so much controversy has resulted from the lack of clear guidelines, it is surprising that the Office has not taken greater initiative in carrying out such periodic surveys.

IMPACT OF SELECTIVE SERVICE

With the change of Selective Service regulations in February, 1968, many fears have been expressed about the impact of the draft on the graduate schools and about the supply of teachers and researchers. Too frequently the very real concerns have been expressed in alarmist terms, as though the graduate and professional schools were about to be emptied of students. This has not yet happened, nor does it seem likely to happen.

In the fall of 1968 graduate and professional enrollments were down slightly—more, it seems, out of adverse expectations on the part of eligible students than because of draft calls themselves. The impact was most notable in those schools which predominantly enroll men, and where students almost always enter in the September following graduation from college. Schools of Law are a prime example, most of which experienced reductions of 10–20 percent in their first and second year classes. Graduate schools of arts and sciences, which enroll a more varied class in terms of age distribution, sex and marital status, have more commonly experienced a drop of only 5–10 percent in first and second year full-time students.

Draft calls were relatively low during the 1968–69 winter, and the policy of permitting a student to complete a semester's study if called during a term has tended to postpone the major impact on the graduate schools until 1969–70. We have attempted to measure the predictable impact of the draft upon the supply of future teachers. We have relied heavily upon the *Survey of Draft Status of First and Second Year Science Graduate Students* compiled by the Scientific Manpower Commission in the fall of 1968. Our model for the prediction of lost or delayed Ph. D.'s is also based partly on Office of Education enrollment data. Table VII shows our estimates. Using this information we have come to somewhat more modest conclusions. We do not anticipate a serious curtailment of scientific research because of manpower shortages falling below the levels already dictated by more stringent budgetary measures; nor do we believe that the draft will result in critical shortages of college and university faculty in the early 1970's.

The potential loss, or delay, of 21,200 doctorates will be spread over a period of five to seven years. To estimate the annual impact we have assumed the following typical time periods for normal completion of degrees:

5% complete doctorate in 3 years.
25% complete doctorate in 4 years.
35% complete doctorate in 5 years.
25% complete doctorate in 6 years.
10% complete doctorate in 7 years.

TABLE VII.—*Predicted temporary loss of doctorates due to draft, from among 1968–69 graduate students*

Category of student	Number of full-time students	Number of full-time male students	Number of draft eligible [1]	Potential temporary loss of Ph. D.'s [2]
1st year	172,000	120,000	46,000	11,500
2d year	78,000	55,000	21,000	9,700
3d year and beyond	51,000	36,000		
Total	301,000	211,000	67,000	21,200

[1] Estimated number of males with I-A and II-S status, based on survey by Scientific Manpower Commission.

[2] Experience indicates that approximately 24 percent of 1st year, and 40 percent of 2d year graduate students ultimately complete the doctorate.

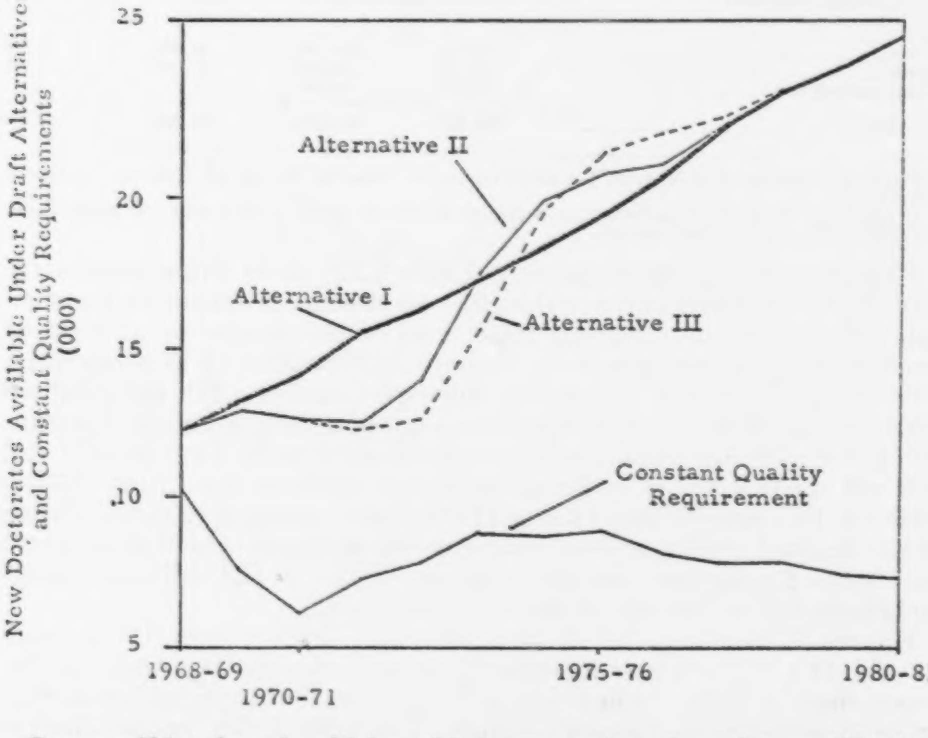
Based on this assumed pattern, Table VIII gives three alternative projections of doctorates for the 1970–80 decade. Alternative I anticipates an immediate (Spring 1969) end of the draft—or at least of draft calls of current graduate students. Alternative II assumes draft calls remain high for the period through August, 1969, and that all currently eligible first and second year students are called up. Alternative III anticipates continuation of draft calls until August 1970 and that all draft eligible entering graduate students are called during 1969–70. For alternatives II and III we have assumed that two-thirds of the drafted graduate students return to graduate school after a two year loss of progress toward a degree. With the G.I. bill provisions we believe this to be a conservative assumption.

Figure II pictures the shift of doctoral degrees over the coming decade. If the preceding analysis is correct, the postponement of degrees comes at a time when this will not represent a crippling of educational or scientific research efforts. The same draft impact, had it occurred in the 1960–68 period, would have been severely damaging. Because the impact occurs in the early 1970's, it is likely to be absorbed without undue disruption. This is not to minimize the effect of the draft on individual careers, or the possible waste through death or injury to some of the brightest members of the younger generation. It merely indicates that the market situation is altering in such a fashion that it can absorb this impact without serious curtailment of academic endeavors.

TABLE VIII.—*Estimated impact of the draft on doctoral output*

Year	Alternative I	Alternative II	Alternative III
1968–69	24,500		
1969–70	26,400	25,915	25,915
1970–71	28,200	25,200	25,200
1971–72	31,000	25,050	24,550
1972–73	32,700	28,250	25,250
1973–74	34,800	35,105	31,290
1974–75	36,900	40,010	38,990
1975–76	39,100	41,640	43,210
1976–77	41,600	42,350	44,340
1977–78	44,800		45,600
1978–79	47,200		
1979–80	49,100		

Figure II--New Doctorates Available
Under Alternative Draft Assumptions, and
Constant Quality Requirements
1968-69 through 1980-81



One qualification should be added concerning the sciences. The impact on science doctorates may be somewhat more marked for several reasons: a higher proportion of males, a higher than average success pattern in completing the doctorate, and a lower than average elapsed time for earning the doctorate. Offsetting these tendencies, some senior and junior science personnel will be released from research projects because of the reduced level of funding. It is also likely that, once the Vietnam war is ended, a sizeable number of science and engineering personnel now working in government and defense-related industry will be available for employment in other sectors, helping to offset any possible temporary reduction in new science doctorates emerging from the universities.

The heaviest impact of the draft on the universities, we believe, is not on future teaching and research staffs, but is on the current economy of graduate education. Private universities particularly, suffering an unexpected 5 percent to 20 percent reduction in tuition revenues, are experiencing soaring deficits in graduate studies. In the midst of other inflationary pressures, this is a financial blow that few institutions can easily absorb. If the draft continues for another year, the most crippling effect may be on the delicate financial balance of graduate education. Special Federal support may be needed to compensate for the drastic income effect many universities are suffering as the result of Federal Selective Service regulations.

OLD OUTLOOKS AND NEW INSIGHTS

It is not surprising to find the Congress somewhat confused in its view of future needs of highly educated manpower when the educational community and the responsible Federal agencies themselves have been puzzled by conflicting evidence. Until 1965 the evidence seemed to be clear: higher education was fast approaching a crisis because of the scarcity of well-trained college teachers.

In our earlier investigations, we kept arriving at conclusions that seemed completely inconsistent with what everyone thought to be the facts. For many months we rejected our analyses, blaming the unlikely results on what were assumed to be inadequate data collected by the American Council on Education. The one nagging anomaly was that individual college presidents and deans, when pressed, admitted that things were in reasonably good shape at their own institutions—although they all subscribed to the view that the situation was getting worse and worse for colleges as a whole. The only knowledgeable person who encouraged our efforts was Dr. Bernard Berelson, who, himself, had been roundly criticized because he had not shared the general pessimism in his survey of graduate education completed in 1960.[8]

Preliminary data from the 1963 O.E. survey was made available in the summer of 1964 to a few researchers. This data precisely corroborated the earlier conclusions we had reached. In the fall of 1964, at an advisory committee meeting in Commissioner Keppel's office, the senior author tried out our optimistic and tentative conclusions on an audience of distinguished graduate deans and university presidents and was greeted by amazed disbelief. As an official of the Office of Education remarked, "Everyone knows the situation is rapidly deteriorating; only a blind man would doubt it."

Several months later the authors published their first paper on the subject. We reviewed the experience of the past decade and attempted to see why earlier projections of vast shortages had been so wrong. The paper drew heavily on the 1963 Office of Education (COLFACS) study, and, as mentioned earlier, was critical of the interpretation of the National Education Association biennial surveys.

A second paper was presented at the 1965 American Statistical Association meetings. In this, we developed the projections model with documentation drawn from the 1952–64 period.[9] The model of the faculty labor market, it might be noted, was not highly sophisticated. But it made explicit the assumptions that were implicit to everyone's earlier attempts at projecting future needs.

The reaction to these two papers was a curious mixture over the next two or three years. Most interested researchers who carefully reviewed the analysis were quick converts. Richard Bolt of National Science Foundation, in an independent study for the sciences, had come to similar conclusions. Harold Orlans at the Brookings Institution and David Robinson at the Office of Science and Technology were among the early supporters. The staff of the Office of Education were largely antagonistic, despite the fact that the best corroborative evidence was in the Office's files. For some reason, perhaps because the results could be interpreted as running counter to their legislative recommendations, the COLFACS study was delayed nearly three years in publication. Even when it appeared in 1966, it was presented in such low key that only a very keen student of the subject could detect that its results were revolutionary in nature. Most college presidents and deans retained a healthy skepticism, although a third paper presented by the senior author in 1965 at the American Council on Education annual meeting finally won many of them over.[10]

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[8] Bernard Berelson, *Graduate Education in the United States* (New York: McGraw-Hill Book Co., 1960), pp. 69–80.

[9] "The Supply and Demand," *op. cit.*

An independent study by John Folger, Director of the Commission on Human Resources and Advanced Education, agrees essentially with our findings.[11] Folger notes the repetition of the errors made in the 1950's, when dire teacher shortages predicted for the elementary and secondary schools never materialized.

Oddly enough, despite the accumulating evidence and weight of knowledgeable opinion, the Office of Education *still* clings to a kind of scarcity mentality. The latest review of the situation by the Office's Research and Analysis Staff, made in October 1968, is ostrich-like in reviewing the accumulating evidence, and concludes stubbornly that: "the testimony of people in the field is that faculty shortages have existed, do exist, and will continue to exist as far into the future as prudent men can see.[12]

One can only surmise that old dogmas are difficult to dispel, and that no amount of evidence other than men with Ph.D.'s selling apples on street corners is going to convince some people that market situations are dramatically changing around them. We claim no omniscience in judging the imponderables of the future, but we do believe it is a poor service on the public to be so determinedly blind. The compelling arguments for continued Federal support of graduate education are not supposed dire shortages, but the inequitable cost burden now shouldered by a small number of institutions, public and private, who perform this vital national service. Those of us in higher education are ill-served by alarmists whose predictions no longer fit the facts, for we would not have the Congress several years hence charging us with having misled the public (even with good intentions).

The National Science Foundation published its projections of science and engineering staff required in universities and colleges in a well documented monograph in 1967. It notes, "The conclusions reached in this analysis tend to conform generally to those obtained in recent studies by Cartter and Folger." [13] We commend it not because it generally agrees with our conclusions, but because the authors are explicit in their methodology. The NSF study assumes that student enrollments in the sciences by 1975 will be 18 percent greater than the Office of Education estimate, and also that doctoral degrees will rise faster than O.E. predictions, but these assumptions are clearly stated and can easily be adjusted for if incorrect. Even with these differences.

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[10] "Future Faculty Needs," *op. cit.*

[11] John K. Folger, "The Balance Between Supply and Demand for College Graduates," *Journal of Human Resources*, II :2, Spring 1967.

[12] John L. Chase, "Estimates and Opinions Regarding the Demand for Professional Staff in U.S. Higher Education," Mimeo., October 14, 1968.

[13] *Science and Engineering Staff, op. cit.*, p. 7.

the NSF study shows that while some 40.3 percent of all science doctorates had to enter college teaching in the 1964–68 period to maintain the quality of staff, in the 1969–75 period only 26.5 percent will be required. Thus, regardless of the absolute position (which does not appear to have deteriorated over the past five years), the period immediately ahead appears to be one of relative improvement for colleges and universities.

In reviewing current attitudes and views, we believe that the projected market picture for college teachers and research personnel we have presented here, is generally in keeping with views of skilled observers in NSF, the Office of Science and Technology, and the National Academy of Sciences. Even though the Office of Education has itself provided some of the best data to clarify the situation, the advice given to the Congress and the gradute schools from this source must be seriously questioned.

We would add one cautionary note. Predictions of overall supply and demand conditions are likely to be more correct than predictions for a more narrowly defined sub-field. Just as the NSF projections may incorporate a hopeful increase in science enrollments relative to the total universe of college students, so professionals in any one discipline are even more likely to construct models which favor their field. Recently the mathematicians surveyed their needs and resources and concluded that there would be a continuing shortage of adequately trained faculty.[14] They are undoubtedly correct in certain specialties, such as computer programming, and they may be correct in the overall assessment. However, they have assumed that mathematics will markedly increase its share of total students, and that rising math requirements in other fields (e.g. engineering, the social sciences) will sharply increase the demand for service courses. The danger of an analysis for a single field is that almost every discipline believes its share of the total will improve over current trends, and quite obviously all fields cannot be correct in the underlying belief. This is not to detract from the very excellent study done by the mathematicians, but to register the authors' view that we feel their assumptions are unlikely to be completely fulfilled. (Or, stated another way, their assumptions may be fulfilled not by the employment of so many additional mathematics teachers, but rather by the use of more mathematically oriented engineers, economists, physicists, psychologists, etc.)

However, we would know much more about the academic marketplace and future manpower requirements if scholars in all professional fields would give as serious study to the problems as the mathematicians have done.

IMPLICATIONS FOR PUBLIC POLICY

We have taken a reasonably optimistic view of the future adequacy of the supply of scholarly talent. Even the diversion of young men into the armed services under current Selective Service procedures, does not appear to us to have serious implications for the future supply of needed college teachers, although it represents an unnecessary human wastage. Our estimates of the future, however, are based on the assumption that there will be no further major changes in the support pattern of students and institutions of higher education. Thus it would be as incorrect for the Congress, as it would be of universities in general, to assume that the job is done and to wash their hands of any future responsibility.

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[14] *The Mathematical Sciences: A Report* (Washington: National Academy of Science, 1968).

On the contrary, the analysis suggests that in most fields of study the arguments for support of graduate students as an *inducement* to enter a field in short supply are no longer as compelling as they were in the immediate post-sputnik period. We believe the arguments for minimizing the grossly inequitable graduate education cost burden on the public and private universities are important ones.

The nation is accomplishing a goal that was thought unattainable a few years ago, by virtue of a strong partnership among public and private agencies. If the Congress had not acted with determination in the 1958–65 years to support graduate education, and if the States and the private universities had not been willing to invest untold millions in what they believed to be the highest priority task in the nation, the goal of insuring an adequate supply of the best brains and talents for college teaching, research, government and industrial service would not have been achieved prior to the 1980's.

Now that we are within sight of this goal we can afford to concern ourselves with the long-term health and vigor of the system which has responded so effectively. Graduate education is truly a national responsibility, and as this study emphasizes, the market for students achieving the Ph.D. is a national one. However, Federal support for graduate education has remained largely indirect—for student support, for contract research, for physical facilities. The burden of costs, which in most graduate programs surpass $5,000 per student annually, are borne unevenly by the States and by a relatively small number of private universities. Recent Federal reductions in aid, plus the drafting of graduate students, have placed an even greater burden on the institutions, frequently at the expense of undergraduate education and other services to the community.

The projections of doctoral supply indicate that a rapidly increasing proportion of the total will be available for nonacademic forms of employment—in government, industry and nonprofit agencies. This can only be viewed with satisfaction, as a mark that this nation has met its critical priority needs and can now begin to utilize this talent in a broader array of challenging tasks. If we are to revitalize the cities, improve the public schools, conquer pollution, improve health standards, explore outer space, and a hundred other tasks claiming our attention and energies, our strongest asset will be an expanding reservoir of highly trained talent. A noted philosopher stated that the task of the universities is to create the future; the nation's graduate schools have responded admirably in creating an adequate supply of the nation's most talented young men and women trained at the highest degree level.

Private Demand for Higher Education in the United States

Paul Feldman **and** ***Stephen A. Hoenack****

I. INTRODUCTION

Higher education is subsidized in the United States because many Americans believe that there are virtues in an educated public. An important consideration of public policy is the appropriate size of subsidies to higher education and the allocation of these subsidies among the recipient beneficiary groups. The public's benefits from subsidizing higher education can be analyzed in terms of who is being educated and the quality of education. For example, these benefits probably differ according to the intelligence and socioeconomic status of students and the type of higher education that they receive. For this reason, it is appropriate to measure the achievement of many of the intended objectives of subsidizing higher education on the basis of grouping students into the several socioeconomic and intelligence categories who receive various types of higher education.

To the extent that policy makers have explicit objectives concerning enrollments from the various student categories, knowledge of each group's sensitivity of college enrollment to tuition charges can be used to set prices for college attendance in order to achieve the stated objectives in an efficient manner. Ordinarily, however, objectives are not precisely articulated. Policy makers usually cannot rank the relative importance to the public of different objectives in subsidizing higher education. Nor do they know the public's willingness to trade their own individual aims or other national objectives for the achievement of those related purely to higher education. Thus, for the foreseeable future, it will be necessary to make subsidy decisions on the basis of judgment. Yet, the quality of judgments can be improved undoubtedly by knowledge of the many options which are feasible. In this context, information about private demand for higher education can enable the policy maker to explore the alternative sets of enrollments from the various categories of students before choosing any one of them.

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II. ECONOMIC ANALYSIS OF STUDENT CHOICE

A. THEORY OF INDIVIDUAL BEHAVIOR

Depending on his qualifications, a high school student has a number of mutually exclusive options available to him. These ordinarily include entering the labor force on a full-time basis, entering one of the Armed Services, attending one of several types of colleges and universities (which may or may not include entering the labor force on a part-time basis), and doing nothing. All of these options differ in non-monetary and monetary costs and rewards over a long period of time. We assume that each individual calculates subconsciously, at least, his present valuation of non-monetary and monetary costs and payoffs for each option which is open to him and chooses the one which has the highest net present value. A discussion of the economic analysis of student choice which is more detailed than the following discussion can be found in (6).

Education is a costly investment whose payoffs we assume to be positively associated with ability and motivation. We also assume that individuals who come from families with relatively high incomes, and who are intellectually gifted are relatively more likely to rank educational options above other possible choices. We further assume, everything else remaining the same, that the lower the monetary cost of a given educational option for which one is eligible, the more highly he will rank it. We therefore expect a negative relationship between the tuition level at a type of college and an individual's probability of choosing it. On the other hand, we have no *a priori* beliefs about the effect of labor market opportunities on the ranking of educational options because working on a part-time basis and going to college are not mutually exclusive activities. While high wage rates represent a high monetary opportunity cost of studying and spending time in class, they also provide the opportunity to earn a higher income by working part time while attending college. This has both a negative and a positive effect on college attendance. The negative effect is due to foregone earnings from attending college while the positive effect results from the student's ability to defray a part of his college costs. The higher the student's intelligence the more willing he is likely to be to forego current earnings in favor of college attendance, thus reinforcing the positive effect alluded to in the previous sentence.

For our estimates of price responsiveness we may distinguish the behavior of two kinds of individuals: (1) those who rank at least one non-educatonal option among their most preferred available options, and (2) individuals who rank only educational options among their most preferred available options. By definition, the first type of person is at the margin between attending college or not attending college. The second type is at the margin between attending the various kinds of college which differ in expected non-monetary or monetary payoffs or in the timing of those payoffs. The behavior of those individuals who do not consider college and those who are committed to a particular type of school will be insensitive to parameters which can be manipulated by government or academic administrators. The following empirical analysis relates only to the behavior of the first type of individual.

B. Theory of Group Behavior

Consider any option and some variable which affects an individual's assessments of its desirability. In principle, it is possible to form a frequency function of all individuals eligible for the option according to the level of the variable at which they are indifferent between that option and their most preferred alternative. Specifically, an individual can consider a given type of college along with its tuition fee. Conceptually one can order all eligible individuals according to the tuition level at which they are indifferent between attending that type of college or attending another type, or not attending college at all. The tuition level at which an individual is indifferent we define as the "critical cost." For all students in a given family income class we assume that frequency distributions of critical costs are unimodal and that the positions of these frequency distributions shift as a function of other variables such as academic ability.

Figure II–1 illustrates a hypothetical case involving low and high income groups.[1] The dispersion of critical costs of individuals having the same family income is due to differences in other factors such as tastes, abilities, and time preferences. Suppose that the tuition level is oa. The areas under the frequency curves to the right of a vertical line drawn from a represents the college attendance from each income group. If tuition were increased from oa to ob then attendance proportions would be reduced by abji and abfe in the lower and higher income groups respectively. Note in this example that the *proportionate* decrease in attendance by low income students is greater than that for high income students. However, if the initial tuition level were oc, and tuition were raised to od the proportional enrollment impact would be greater in the higher income group.

The corresponding enrollment proportion demand curves are shown in Figure II–2. These curves are derived by integrating the frequency functions shown in Figure II–1 and labeling the axes in the traditional manner. They are S-shaped because the frequency functions from which they are derived are unimodal.

The purpose in presenting this theoretical discussion is to facilitate the reader's understanding of our empirical results. Some of these results are not intuitively obvious. For example, the responsiveness of enrollment proportions to changes in tuition often increases with family income. The theoretical framework presented here enables the reader to imagine how a result, which is not immediately evident, can occur.

C. Possible Difference Between the Behavior of Males and Females

It appears reasonable to make the following assumptions about differences between the college attendance behavior of males and females: (1) Males expect higher monetary returns from higher education than do females. (2) Males and females expect the same non-monetary re-

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[1] The reason that the vertical axis cuts through the frequency function is that presumably not all individuals would go to college at zero college cost. We emphasize that the population for which the frequency function is defined includes all eligible individuals, including those who do not go to college.

FIGURE II-1

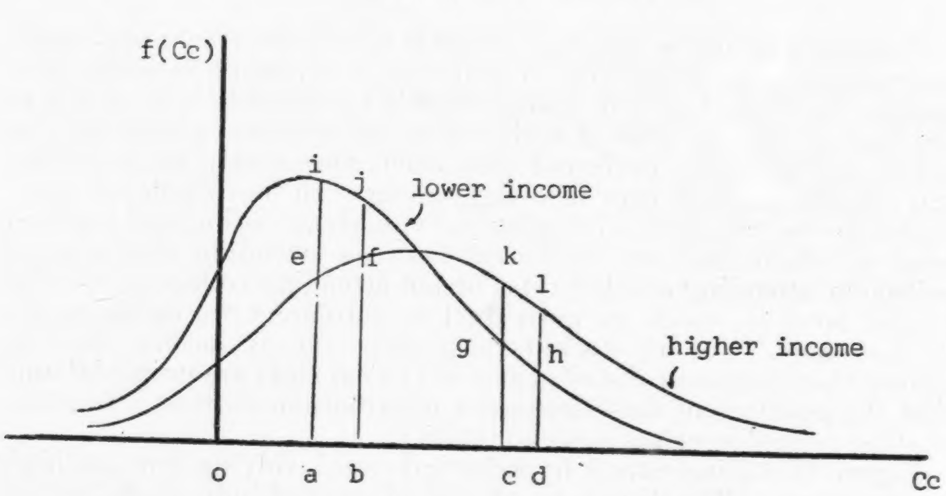
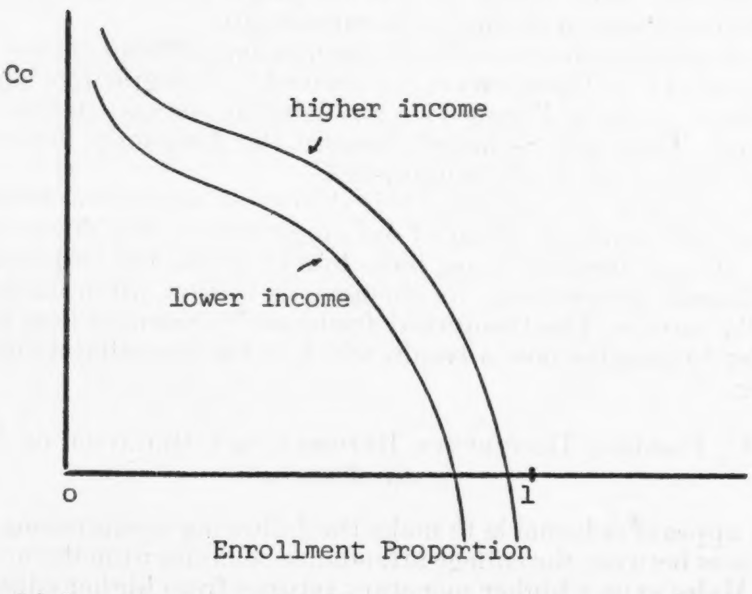


FIGURE II-2



turns from higher education. (3) Expected monetary and non-monetary returns from higher education are more positively correlated for females than for males. Our justifications for these assumptions are, in order: (1) Males expect to work during larger percentages of their lives than females, (2) there is no available evidence to distinguish between sex the various non-monetary aspects of higher education, (3) females have considerably less social pressure than males to enter the labor force. Therefore they are more likely to enter the labor force and earn money with their skills on the basis of purely non-monetary enjoyment of the using their skills.

These assumptions lead to the conclusion that at relatively high college costs male and female response is more similar than at relatively low college costs. In particular we expect that the subgroup of females who would go to college when tuition is high will react to changes in tuition about as strongly as a similarly defined subgroup of males. The remaining subgroup of males and females both have relatively low expected non-monetary returns from higher education. The major difference between these subgroups is that the males expect relatively higher monetary returns from college education. Therefore less motivated males tend to have higher and more uniform critical costs for college attendance than do the less motivated females. Thus it is quite possible for female college attendance to be approximately as high as male attendance and at the same time for tuition to have a larger impact on the enrollments of males, than females.

III. THE ESTIMATING PROCEDURE

We estimated private demand for higher education with a cross-section sample in which State averages were used as observations.[2] The data used were generated in 1963, a year in which the influence of the draft on college attendance probably did not vary much between States.

The dependent variables are proportions of 1960 high school tenth grade male, and female, students who attended any college offering degree credit courses within one year of scheduled graduation from high school.

The predetermined variables include:

(1) tuition at each type of institution;

(2) proximity of the state's population to each type of institution;

(3) labor-market variables: earnings and unemployment duration rates;

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[2] The data which we used in this study are described in detail in Appendix B. Most of the data were constructed from the tenth grade project TALENT files. Project TALENT was conducted for HEW by the American Institutes for Research. In the survey a national sample of 1960 tenth graders were given a battery of aptitude tests, and were asked a series of questions relating to their socioeconomic status, plans, etc. In addition the same individuals received follow up questionnaires about one year after scheduled graduation from high school. We constructed for each state the following variables: proportions of individuals who went to college, labor market variables, and test score variables, and variables for education of parents. The remainder of our data, in particular our tuition data, were constructed from published sources and are generally applicable to persons residing in the state.

It would have been possible to use individual observations in our regression equations instead of observations grouped by states. That would have produced an interpretative advantage: the results would have applied to individual behavior rather than group behavior. Those results would have permitted the policymaker to determine the effects of policy changes specifically on individual behavior. By using state averages the policymaker is able only to generalize about enrollment behavior rather than to be specific about it. We did not use individual observations because of a requirement when this study was begun to obtain some results in a short time span. Future studies should use the individual data in order to gain the advantage of interpretation alluded to above.

(4) performance on aptitude test or "test score;"[3]

(5) urban-rural population composition;

(6) education of parents as a proxy for family income. (The procedure used in estimating family income as a function of parental education is discussed in an Appendix which is available from the authors upon request.);

(7) regional dummy variables;

(8) interaction terms among the predetermined variables (the nature of the interaction terms and our procedure in making inferences from them are discussed in an Appendix which is available from the authors upon request).

Our results should be interpreted as indicative of long-run group behavior for two reasons. The first is the usual one, i.e., that estimates obtained from cross-sectional regressions are interpreted in a long-run context. Secondly, and more pointedly, the use of tenth graders rather than twelfth graders, means that the time between the testing of students and their actual entrance into college is long enough to include the option of dropping out of high school before graduation.[4] In addition we wish to emphasize that our results are indicative of group behavior rather than individual behavior because we have used state averages.

While our dependent variable includes individuals who go out of state to college, our tuition and labor market variables are specific to the state of the student's high school. Our assumption is that if individuals who consider going to a college which is out of their home state are influenced by our variables, they are influenced only in regard to which college to attend, not in regard to whether or not to go to college. In 1963, approximately 82 percent of all undergraduate college students attended college in their home States.[5]

The most difficult estimation problem was the isolation of the effects of family income and test score upon an individual's response to changes in tuition. These effects of income and test score were estimated with the use of interaction terms among the predetermined variables.

For the reader who is not familiar with the use of interaction terms[6] a simple example might be helpful.

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[3] Performance on aptitude test or "test score" must not be construed as synonymous with natural ability. We recognize fully that test score is a proxy for a whole congeries of factors. The major ones are previous schooling, family environment, motivation, as well as natural ability. While natural ability may not vary too much by region, test score does. For predictive purposes, we make the assumption that, the mixture of qualities which contribute to the test score variable will be the same over a long period of time. Finally, for stylistic reasons, we do not always use the term "test score" in the text; frequently we use words like "ability," "capability," and "aptitude" but they all refer simply to performance on an aptitude test.

[4] While we did not explore thoroughly the effects of college tuition upon rates of high school completion, preliminary estimations of the model using high school completion rates as the dependent variable lead us to believe that a significant relationship exists. This finding would tend to substantiate results of a study (6) which found that the expense of attending college affects the high school performance of students who graduate from high school.

[5] U.S. Office of Education, *Residence and Migration of College Students*, OE–54033. Government Printing Office, Washington, D.C., 1965.

[6] The use of interaction terms ordinarily introduces multicollinearity into a regression equation when the component terms in an interaction term are entered individually in the same regression. Multicollinearity tends to reduce the statistical significance of estimated coefficients in a regressive equation. However, interaction terms in our equations improve their specification, which tends to increase the statistical significance of estimated coefficients. In the estimation of our equations the net effect of including interaction terms has been a substantial increase in the statistical significance of all estimated coefficients.

Let:

$$\frac{A}{E}=\alpha_0+\alpha_1T+\alpha_2Y+\alpha_3I+\alpha_4TY+\alpha_5TI$$

where
A=number of tenth graders who go to college
E=high school tenth graders
T=college tuition
Y=average family income
I=seventy fifth percentile test score in the group
then

$$r=\frac{\partial\left(\frac{A}{E}\right)}{\partial T}=\alpha_1+\alpha_4Y+\alpha_5I$$

and

$$\frac{\partial r}{\partial Y}=\alpha_4,\ \frac{\partial r}{\partial I}=\alpha_5.$$

The partial derivative of A/E with respect to T gives the direct effect, r, of changes in tuition on rates of college attendance. The partial derivatives of r with respect to income and intelligence yields terms α_4 and α_5 which describe how the sensitivity of attendance rates to tuition varies with income and intelligence.

The variable which we used in the interaction terms as a proxy for the influence of family income on the response to tuition was average level of education of the fathers of all students in the sample. In an Appendix which is available from the authors upon request, we describe in detail the nature of the aggregation involved, and the procedure that we used in translating father's education into a value for family income. The measure of intelligence which we used for each observation in our regression equations was the value for the seventy-fifth percentile of performance on Project TALENT tests (hereafter referred to as "test score") in the observation. We reiterate that our proxy for family income and our variable for intelligence do not apply to individual students but to groups of students.

There is a further limitation to our estimating procedure. We could find no variable to control explicitly for the influence of college admission standards on college attendance rates, although we suspect that test score may control in some small degree for that influence. We believe that whatever bias this omission introduces is minor, because in most States there is at least one school of each type with relatively low admission standards [7] and opportunities to attend some *type* of institution are not usually restricted because of a lack of aptitude.

We measured proximity of each type of institution to population in the State through use of a computer program which calculated the percentage of each State's population living within specified distances of each type of institution. We then gave appropriate weights to each calculation in order to approximate the average travel expense in the State to attend each type of institution. Unfortunately the travel expense measures for the different types of institution were very highly correlated with each other and with our estimate of the percentage of each State's population living in urban areas. Therefore, our only travel expense measure was our percent-urban variable. When we entered our labor market variables into our regression equations along with our percent-urban variable, the latter variable did not enter significantly along with the other variables in our regression equations.

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[7] This is a judgment based upon information on college admission selectiveness made available to IDA by the American Council on Education.

We had no strong *a priori* expectations of the form of our equations and we used two criteria to determine the form of our interaction terms. (1) The coefficients on the variables interacted on each other as well as the simple income and test score variables used in the same regression[8] had to be estimated with confidence greater than 90 percent using a two-tailed test. (2) Standard *a priori* expectations had to be satisfied concerning total effects of tuition, income, and test score changes upon attendance rates. Thus, with respect to the aggregate attendance model, we required increases in tuition to have a negative net influence upon attendance and we required further that increases in test score and family income have positive effects upon attendance. Since in each case the net influence is the sum of more than one estimated coefficient, our criteria did not specify the sign of any single estimated coefficient. We ran regression on the same set of data until our criteria were met. In this process, we often discarded regressions which fit the data very well but failed to meet our criteria fully.[9]

In regard to the functional form of our estimating equation, our transformation of the independent variables was determined by the form of the interaction terms. Our transformation of the dependent variable was based on our assumption that frequency functions of critical costs for college attendance are unimodal. We used a logistic[10] transformation of the dependent variable.

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[8] It is necessary to include tuition, family income and intelligence alone in the regression equation as well as in interacted form. If any of the individual variables were left out of the regression equation the interaction term(s) which included the variable would be forced to represent both the interaction (slope) effect of the variable as well as its direct (intercept) effect. In regard to our regression equations for female college attendance behavior, our variable for intelligence did not enter significantly alone. Therefore we rejected the hypothesis that intelligence has an effect on female college attendance choices which is not interacted with other variables which affect these choices.

[9] Strictly speaking, our results are applicable only to the population observed. Because of the large size of the sample, however, we believe that our results are generally applicable to the behavior of all high school students. Nevertheless, the reader should be forewarned that any assertions of the usefulness of our results beyond the behavior of the observed individuals is ultimately a statement of belief about the representativeness of the observed population. We refer here to the representativeness of the *behavior* of sampled individuals, not to the representativenss of the sample itself. We are interested in the effects of income and ability upon college attendance decisions. Even if the sample is biased toward particular income and ability individuals, they need only be properly representative of the behavior of individuals in those income and ability groups to provide valid estimates of the desired effects.

[10] The advantages of a logistic function are threefold: (1) Weights for correction of the type of heteroscedasticity which we expected on *a priori* grounds are readily calculated; (2) it is an exact procedure (as opposed to an iterative procedure). See (1, 2) for detail on this point; and (3) can be modified to vary the point of inflection according to the best fit data. The main advantages of the logistic function are that (1) its statistical properties, including its relationship with the log-normal distribution are not precisely known, and (2) the small sample properties of the exact minimum χ^2 estimation technique have not been carefully explored and compared with the (iterative) maximum likelihood estimation technique. We made no empirical tests for heteroscedasticity. Rather we made the standard assumption that the observed ratio dependent variable represented the average choice of all eligible individuals in a group where each individual's choice is represented by a zero-one variable which is binomially distributed and weighted accordingly.

The reader will note that we have not specified a supply equation. Thus, if our estimates are to be interpreted as demand equations it is necessary to assume that the supply curves are perfectly elastic. Supply curves for higher education are determined by the resource costs of higher education and the willingness of the public to subsidize higher education. The alternative uses of resources used in higher education in a particular state (i.e., faculty, buildings, etc.) are higher education in other states, and a wide variety of other noneducational activities. It is not reasonable to assume that the differences in demand for higher education that exist between states are large enough to affect the prices of these resources. These comments are applicable to all types of higher education. In regard to the public's willingness to subsidize higher education, we suggest in Section V that it would be desirable for this willingness to vary with the private demand for higher education. When a collective activity is less costly, all other things equal, more of it should be demanded. However there is no evidence that this is in fact the case. We know that there is a strong positive relationship between the private demand for higher education and family income. We have tested the hypothesis that there is a negative relationship between tuition at four year public institutions and family income, and rejected it on the basis of the evidence. This tuition variable is a reasonable proxy for lack of collective willingness to subsidize higher education because, assuming a zero or positive relationship between quality, and therefore the cost of operating a four year public institution, the lower the tuition, the greater the subsidy. Thus the observed absence of any significant relationship between educational subsidies and private willingness to pay for higher education implies that the subsidized portions of supply curves for higher education are perfectly elastic. Therefore we think that the assumption of elastic supply curves for higher education is a reasonable one to make.

IV. THE DEMAND FOR HIGHER EDUCATION IN THE UNITED STATES

This section describes our estimates on demand for higher education in the United States. The estimated effects of changes in tuition on group college attendance behavior are presented first. Next we describe the estimated results on the effect of earning opportunities on college attendance.

A. The Effect of Tuition on College Attendance

The results of the effect of tuition on college attendance are summarized in Figures IV 1–3. An Appendix available from the authors upon request presents a detailed display of these results. All of the results described below refer to the estimated effects of a $100 increase in tuition on the proportions of high school tenth graders in various test score and family income categories who go to college.[11] To facilitate the discussion we shall refer to these proportions as "enrollment proportions." For example, Figure IV 1 shows how the enrollment proportions would change if tuition at all U.S. four year public colleges and universities were increased by $100. We wish to emphasize that we are presenting our estimates as the effects of changes in tuition on the participation of population groups in higher education. We do this because such a manner of presentation is pertinent to the potential usefulness of our estimates for policymaking. By referring to Tables V 1–3 the reader can express our estimates of the effects of changes in tuition on enrollment relative to existing enrollments, rather than to population groups, if such calculations would better serve his purposes.

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[11] In the following discussion the expressions "go to college" and "college attendance" will refer to the choice to attend a degree credit granting institution within one year of scheduled graduation from high school. Proportions are defined to range between zero and one. In the tables in this section the percentile values are defined as the value of the national test score percentile which equals the group's seventy fifth test score percentile. See the Appendix available on request from the author for further explanation of the calculations.

FIGURE IV-1

The Estimated Effects of a $100 Increase in Tuition at Four Year Public Institutions on Enrollment Proportions

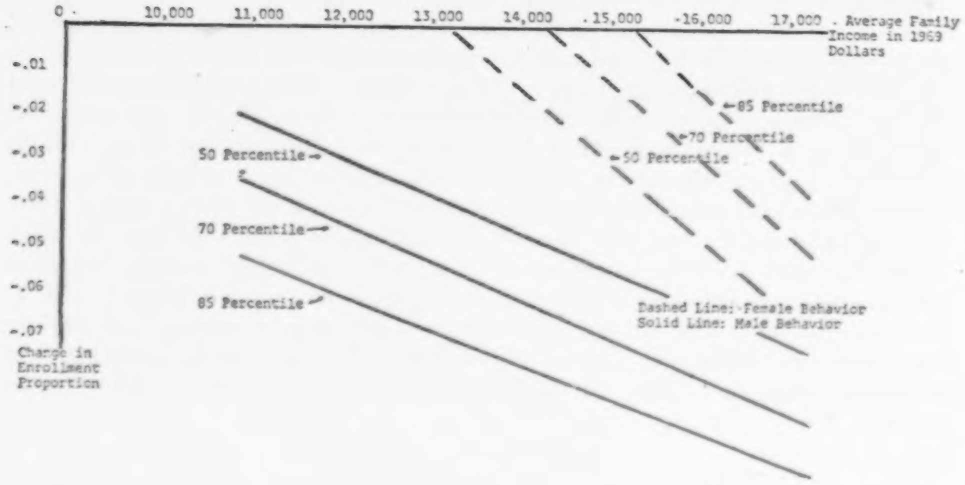


FIGURE IV-2

The Estimated Effects of a $100 Increase in Tuition at Four Year Private Institutions on Enrollment Proportions

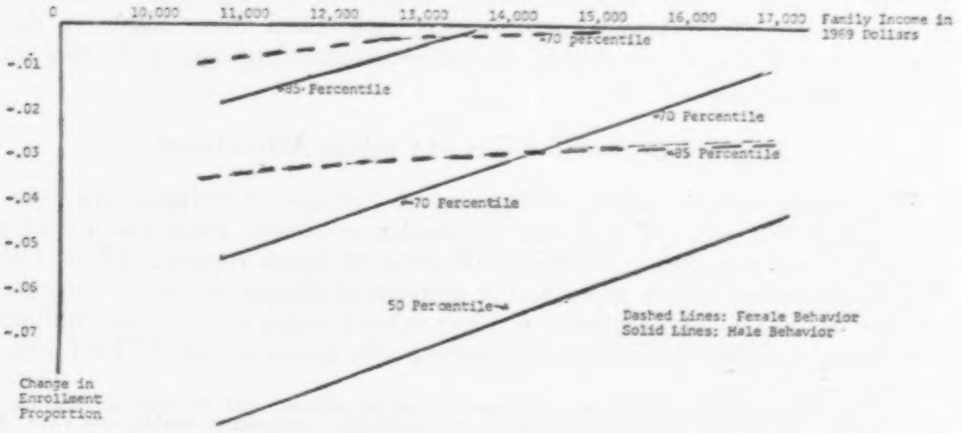
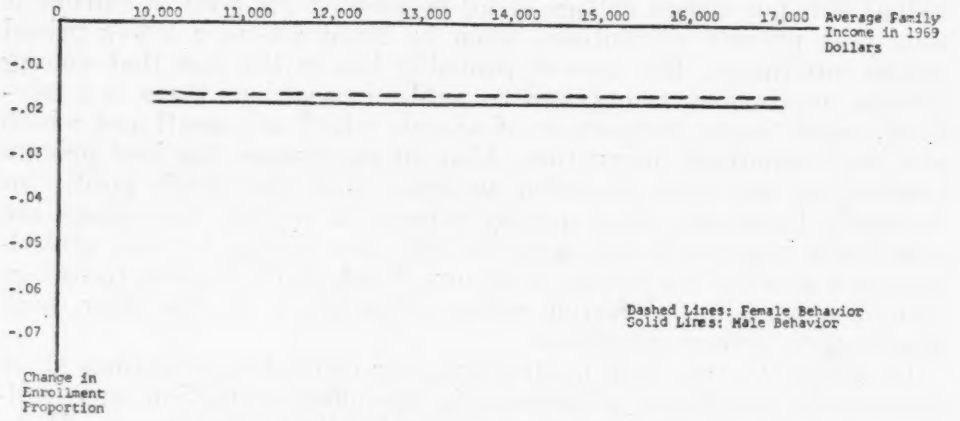


FIGURE IV-3

The Estimated Effects of a $100 Increase in Tuition at Two Year Institutions on Enrollment Proportions



The *results presented in this section have a special interpretation.* They express the effect of monetary cost, exclusive of foregone earnings, on the college attendance decisions only of potential students who are indifferent whether or not to attend college given the prevailing tuition charges. If tuition fees change at a particular type of college, these indifferent persons will respond in a predictable way. Measurement of that response is the purpose of the present discussion.

The most important result one immediately observes in Figures IV 1–3 is that changes in the level of tuition have a substantial impact on college attendance. Within the observed range of values the largest proportion of students who are influenced by tuition in their choice whether to attend college relates to the group that would attend four year public colleges.

Large numbers of students respond to changes in tuition at low cost public colleges and universities. The estimates therefore tend to confirm the popular conception that these institutions play an important role in attracting large numbers of students. Changes in tuition at private four year institutions have a smaller, but substantial effect on enrollments. Changes in tuitions at two year colleges have a small effect on college attendance.

We suggested in Section II that the responsiveness of enrollment proportions to changes in tuition can be greater in higher family income and test score groups. This suggestion certainly is not intuitively obvious. The reason for it is that higher family income and test score groups may have larger percentages of potential college students who are indifferent about attending college. If, for example, the situation is as depicted in Figure II–1 where tuition is oc and is raised to od, such an observed result would hold. We have estimated that in higher family income groups tuition at four year public institutions has a greater impact on enrollment proportions that in lower family income groups. The opposite holds for four year private institutions.

The subgroup of students who are indifferent whether to attend college within the observed range of tuition at four year private institutions is relatively small. It is interesting to question why an individual will not attend college at all because of the level of tuition at four year private institutions when he could attend a lower priced public institution. The answer probably lies in the fact that among private institutions as opposed to public institutions there is a relatively much larger proportion of schools which are small and which give individualized instruction. Also, in most states the best private institutions are often regarded as better than the state's public insitutions. Evidently these quality aspects of private insitutions are sufficiently important that some students are willing to rank attendance at a private institution on the one hand, and not going to college (which can include deferred college attendance) on the other, both above public college attendance.

In regard to two year institutions, our estimating equations show statistically significant differences in the effect of tuition on enrollment proportions among test score and family income groups. However, these estimated differences are very small in magnitude and are hardly worth showing in the figures.

In Section II we deduced from reasonable assumptions that we could expect greater disparity of the critical costs of relatively less college motivated females than males. The reason was that, relative to females, the males can have higher, and much more uniform expectations of monetary returns to higher education. Our results support the hypothesis that in the existing range of tuition levels female college attendance is less responsive to tuition than male college attendance. Evidently in this range more males than females are indifferent whether to attend college.

There is an additional difference between the college attendance behavior of males and females with respect to tuition. In the higher test score categories female attendance is less strongly affected by tuition at four year public institutions, and is more strongly affected by tuition at four year private institutions than in the lower test score categories. The opposite result holds for males. (See Figures IV 1–2).

We shall interpret the different effects of tuition on enrollments according to sex and test score in the following way. First we will assume that the higher the level of test score, the greater the expected returns to education. Thus we expect that among individuals who are grouped by intelligence level, the higher the level of the group's intelligence the further to the right the group's frequency function of critical costs for college attendance (See Figure II–1). Second, we will continue to make our assumption that among the individuals who would not attend college at the highest observed level of tuition, females are relatively more diverse in their willingness to pay for higher education. Since tuition is relatively low at four year public institutions it is plausible that the observed range of tuition is in the left tail of each frequency function of the critical costs of females grouped by intelligence. Under our assumption the males who would not attend college at the highest level of tuition have higher and more uniform expectations of monetary returns from higher education. Under this assumption it is plausible that their frequency functions of critical costs for college attendance are substantially more skewed to the right than those of females. It is therefore possible that while the observed values for tuition are in the left tails of the frequency functions defined for females, they are in the right tails of the frequency functions defined for males. Since for both sexes the frequency functions are further to the right in higher test score categories, we can imagine, under the behavioral assumptions we have made that increases in tuition have a smaller effect on female attendance in higher intelligence categories while the opposite is true for males.

The same type of analysis is useful in order to interpret the observed response of female attendance to changes in tuition at four year private institutions. In this context, tuition at these institutions is high enough that it could be in the right tails of the appropriately defined frequency functions for females.

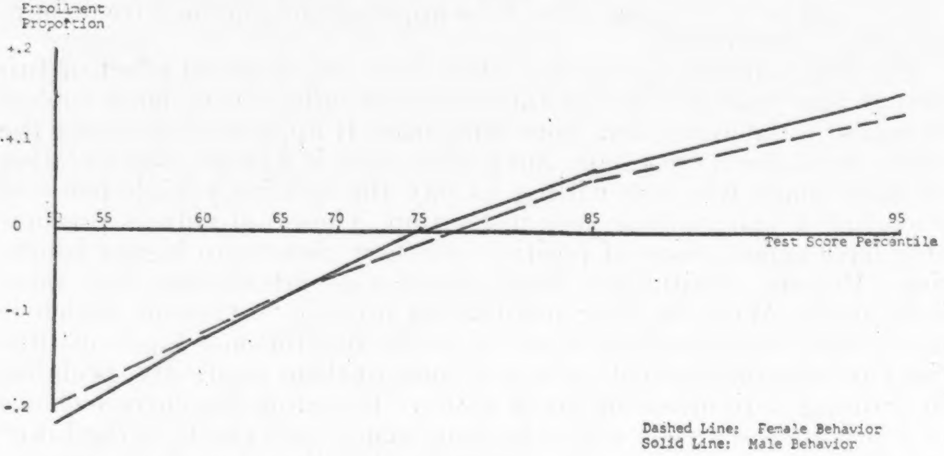
The most interesting interpretation is of the observed effect of tuition at four year private institutions on the college attendance choices of males in the lowest test score categories. It appears that among the males in the lowest test score categories, there is a large subpopulation of individuals who are willing to pay the relatively high price of attending a private four-year institution. These individuals presumably have expectations of positive monetary returns to higher education. Private institutions have substantial advantages for these individuals. Many of these institutions provide instruction which is much more individualized than in public institutions. These institutions are also relatively diverse, and some of them implicitly specialize in training individuals of lower ability. Therefore the correct choice of a private institution probably leads many individuals in the lower test score categories to expect a higher probability of academic success.

A policy issue to which the empirical results of this study are relevant is the following choice. Should subsidies be directly allocated to students which they use to pay tuition at the institutions which they freely choose to attend, or should direct grants be given to institutions for the purpose of reducing their tuition charges? It is possible to estimate from our results the enrollment impact by sex, ability, and family income, of reducing tuition at a particular type of institution. Such a hypothetical reduction in tuition can be uniform or it can be made differently for different categories of students.

Analyzing the enrollment impact of giving individuals in a particular category grants-in-aid which they pay to the institution that they attend is equivalent to analyzing the enrollment impact of decreasing tuition at each type of institution for the students in the category. The reader may estimate the enrollment impact in a test score and family income category of a change in the level of tuition at all three types of institution in the following way. He can add the estimated effects for that category of changes in tuition at the three types of institutions. This estimate will be an overestimate. Unfortunately, due to the limited capacity of our data for additional independent variables in our regression equations we were not able to test adequately the hypothesis that changes in the level of tuition at one type of institution affect the responsiveness of enrollments to the level of tuition at another type of institution. We have for example estimated for female attendance behavior that some such interaction among the tuition variables for two year institutions and four year private institutions exists. While there will be some overestimate of the enrollment impact there is no reason to believe that the overestimate varies substantially by family income or test score. Therefore the relative enrollment impacts in the different categories of individuals, are subject to much less error.

FIGURE IV-4

The Estimated Effect of a $1.00 Increase in the Hourly Wage Rate on Enrollment Proportions



B. THE EFFECT OF EARNINGS OPPORTUNITIES ON COLLEGE ATTENDANCE

Figure IV–4 describes the results of this study pertaining to the effect of earnings upon college attendance. The data we used on wage rates are highly satisfactory as they were derived directly from questionnaire responses from the observed individuals.[12] However, unemployment duration rates presumably are less reliable as they were taken from published data applicable to all age groups.[13] Because of the unreliability of the published data on unemployment rates our study does not include an unemployment variable. The unemployment duration variable in the regression equations was used in order to control for the tightness of the labor market when our major aim was to estimate the effect of wage rates on college attendance.

Figure IV–4 shows the estimated effect of changes in wage rates on college attendance. There appears to be no significant difference between the response for males and females of a $1.00 increase in the hourly wage rate on their enrollment proportions. Our estimates show a positive relationship between test score and the effect of change in the wage rate on college attendance. For example, if wage rates were to rise by $1.00 per hour we would predict no change in the enrollments of students in the seventy fifth percentile intelligence category. The enrollment proportion for students in the eighty fifth percentile intelligence category would increase by about 6 percent, and for persons in the sixty fifth percentile intelligence category enrollments would decrease by about 7 percent.

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[12] An appendix discussing data sources is available from the authors upon request.
[13] *Ibid.*

An illustration of the likely effect of a $1.00 increase in hourly wage rate on the economic situation of a potential college student is instructive. Assume no unemployment and a 2,000 hour work-year. If the individual goes to college let us assume alternatively that:

(1) He is not employed for nine months of the year but fully employed for three months. In other words he works 500 hours a year and has a $500 improvement in annual income at the same time he is in school.

(2) He is employed fifteen hours per week for nine months as well as being employed full time for three months. This means that he works 1063 hours per year. In this case, he has $1,063 more in annual income while he is a student.

If the individual does not go to college, he has $2,000 more in annual income. Therefore under the two hypothetical situations about employment if a person is attending college, his foregone earnings increase by $1,500 and $947, respectively by remaining in school. While the opportunity cost of remaining in college increases in this situation, so does annual earnings. Actual enrollment of students above the seventy-fifth percentile in intelligence will increase, but for some of the students below the seventy-fifth percentile the additional increase in foregone earnings will draw them into the labor market and out of school. This result is consistent with the theoretical discussion given in section II.

V. POLICY IMPLICATIONS

Tables V 1-4 give the enrollment proportions which existed in 1963. The results are classified by test score category and family income quartile in Tables V 1-2, and are further classified by type of institution in Tables V 3-4. In the context of this study these tables have two uses. First, the data presented in them supplies any policy maker with information about the structure of the existing college enrollment proportions in the United States. Knowledge of this structure is, of course, a prerequisite to determining whether existing enrollment proportions should, as a matter of public policy, be changed. Second, these tables will help the reader understand the applicability of the results presented in the previous section. In Section III we explained that the test score and family income variables defining the categories in which our results on the demand for higher education are presented are not values taken from individual records, but are values applicable to groups of individuals. Therefore the reader must apply our results loosely to the test score and family income categories in Tables V 1–4 which interest him.

TABLE V-1.—COLLEGE ATTENDANCE IN THE UNITED STATES

[Proportions of 1960 10th-grade males who entered a degree credit granting college or university within 1 year after scheduled graduation from high school by income and ability quartiles]

Test score and family income	Quartiles				
	FIQ 1 (0–6300)	FIQ 2 (6300–10191)	FIQ 3 (10191–13146)	FIQ 4 (over 13146)	Σ FIQ
TS 1 (0 to 50 percent)	0.175	0.206	0.298	0.488	0.247
TS 2 (51 percent to 70 percent)	.358	.395	.473	.686	.468
TS 3 (71 percent to 88 percent)	.621	.470	.588	.800	.613
TS 4 (89 percent to 100 percent)	.740	.557	.799	.882	.792
Σ TS	.371	.381	.520	.751	.493

TABLE V-2.—COLLEGE ATTENDANCE IN THE UNITED STATES

[Proportions of 1960 10th-grade females who entered a degree credit granting college or university within 1 year after scheduled graduation from high school]

Test score and family income	Quartiles				
	FIQ 1 (0–6300)	FIQ 2 (6300–10191)	FIQ 3 (10191–13146)	FIQ 4 (over 13146)	Σ FIQ
TS 1 (0 to 50 percent)	0.212	0.202	0.263	0.525	0.266
TS 2 (51 percent to 70 percent)	.438	.358	.550	.710	.516
TS 3 (71 percent to 88 percent)	.567	.513	.599	.810	.653
TS 4 (89 percent to 100 percent)	.707	.522	.837	.905	.779
Σ TS	.275	.275	.402	.667	.387

TABLE V-3.—COLLEGE ATTENDANCE IN THE UNITED STATES

[Proportional distribution of attendance at degree credit granting institutions by intelligence and family income (males only)]

Test score and family income	Quartiles														
	FIQ 1 (0-6300)			FIQ 2 (6300-10191)			FIQ 3 (10191-13146)			FIQ 4 (over 13146)			Σ FIQ		
	Public 4-year	Private 4-year	2-year	Public 4-year	Private 4-year	2-year	Public 4-year	Private 4-year	2-year	Public 4-year	Private 4-year	2-year	Public 4-year	Private 4-year	2-year
TS 1 (0 to 50 percent)	.118	.004	.053	.142	.009	.055	.202	.020	.076	.293	.020	.175	.189	.013	.073
TS 2 (51 percent to 70 percent)	.247	.007	.104	.312	.008	.075	.358	.016	.099	.463	.029	.194	.345	.015	.112
TS 3 (71 percent to 88 percent)	.390	.063	.168	.332	.060	.078	.383	.107	.098	.431	.207	.162	.384	.109	.122
TS 4 (89 percent to 100 percent)	.429	.231	.080	.355	.209	.103	.392	.349	.058	.320	.489	.073	.374	.320	.077
Σ TS	.230	.042	.089	.236	.042	.073	.289	.074	.083	.355	.112	.140	.278	.068	.094

TABLE V-4.—COLLEGE ATTENDANCE IN THE UNITED STATES

[Proportional distribution of attendance at degree credit grading institutions by intelligence and family income (females only)]

Test score and family income	Quartiles														
	FIQ 1 (0–6300)			FIQ 2 (6300–10191)			FIQ 3 (10191–13146)			FIQ 4 (over 13146)			Σ FIQ		
	Public 4-year	Private 4-year	2-year	Public 4-year	Private 4-year	2-year	Public 4-year	Private 4-year	2-year	Public 4-year	Private 4-year	2-year	Public 4-year	Private 4-year	2-year
TS 1 (0 to 50 percent)	.151	--------	.061	.144	.004	.054	.208	.005	.050	.346	.050	.129	.212	.015	.074
TS 2 (51 percent to 70 percent)	.374	--------	.064	.289	.007	.062	.488	.011	.051	.602	.032	.076	.438	.013	.063
TS 3 (71 percent to 88 percent)	.431	.059	.077	.368	.056	.089	.486	.073	.040	.519	.204	.087	.451	.098	.073
TS 4 (89 percent to 100 percent)	.412	.166	.129	.325	.163	.034	.457	.342	.038	.362	.475	.068	.389	.287	.067
Σ TS	.277	.035	.064	.235	.033	.058	.344	.059	.048	.430	.125	.101	.322	.063	.071

Another aspect of the applicability of the results should be emphasized. They can be used to estimate the effects on national enrollment proportions of changes at the national level in the sizes of subsidies to college students. The results are not strictly applicable to the problems of determining student subsidy levels in a particular state. Even so, a policy maker at the state level can profitably use our results if, for no other reason, there is no other analytical study available to him. However, if these results are used at the state level, particular caution should be employed in determining whether the various types of college and university differ in relative desirability in the particular state from their average relative desirability across the country. From the point of view of a policy maker at a particular private college or university, even if his institution were typical of its type, our results would probably not be very useful for his purposes. His enrollment objectives relate primarily to enrollments of students at his institution rather than to the participation of various test score and family income groups from the general population in higher education. In particular, our results would not help him determine how changes in tuition or financial aid at his institution would affect his institution's competitive position relative to other institutions.

Tables V 1–2 show that male and female enrollment proportions are strongly associated with family income and with test score. From Tables V 3–4 the reader can determine the distribution of enrollments among four year private, four year public, and two year colleges, for each test score and family income category. The most notable facts in Tables V 3–4 are as follows: In all test score and family income categories, only small proportions of both males and females attend two year colleges. Male and female enrollments at both types of four year institutions increase substantially with test score and family income. Enrollments at four year private institutions are especially strongly associated with test score and family income when test score and family income are at relatively high levels.

To our knowledge no one has measured empirically the extent to which there are excesses of social returns over private returns to higher education, and how those probable excess returns might vary according to the intelligence and socioeconomic status of the student. Therefore it is necessary for policy makers who must allocate public funds among alternative public expenditures, and for policy makers who must allocate subsidies among recipient student groups, to make guesses about the desired level and distribution of educational subsidies. We believe however that policy makers can make much better guesses about the desired level and distribution of educational subsidies in the following way. They can explicitly hypothesize alternative valuations on the level of achievement of competing objectives and observe and compare the probable outcomes of the alternatives before taking any action. The reasons that this type of decision-making process can improve decision-making are twofold. First, ordinarily policy makers are not as explicit as they could be about what they are in fact trying to achieve. By formulating their objectives specifically enough to be able to observe probable outcomes policy makers are forced to think carefully about what they want to achieve. Second it is not possible to determine the most desirable choice among alternative levels of achievement of competing objectives until the relative costs of pursuing the objectives are known. In order to compare the outcomes of alternative sets of objectives these relative costs must be taken into account.

The achievement of educational objectives can be expressed operationally in terms of number of students in the various test score and family income categories who go to college.[14] The policy maker can determine the cost of achieving competing educational objectives with the use of empirical estimates of private demand for higher education. These data can be used to determine for any category of students the necessary tuition level, and therefore the necessary size of the subsidy, if any, to achieve any specified target level of enrollments. Once the necessary subsidy is known, the policy maker may calculate the total cost of achieving his specified enrollment objectives. This total cost may be compared with the cost of achieving differently specified educational objectives. It also may be compared with the cost of achieving other non-educational objectives. An example might be useful. Suppose that public policy makers express an objective that at least forty-five percent of students in the lowest family income categories should go to college. Using estimated enrollment demand curves the policymakers can estimate approximately the necessary subsidy level for students in the lowest test score and family income categories in order to achieve the objective. In one context the policymaker will want to compare this cost with the cost of a policy which more favors other categories of students. In another example of a context the policymaker would want to compare the cost with the costs of increments in the overall quality of higher education. In any case, the policymaker will ordinarily want to revise his target objective of forty-five percent enrollment proportions of students from the lowest family income categories. If the sacrifice of alternative objectives is lower than he expected, he may want to raise the target enrollment proportion, but if he is forced to sacrifice the achievement of alternative objectives to a substantially greater extent than he had expected he will probably want to lower the target enrollment proportion.[15]

We conclude with a brief discussion of some of the practical problems of administering subsidies to college students.[16] Currently two methods of administering subsidies to college students are most widely practiced. First, the tuition that students are required to pay generally is set at a uniform level below the actual cost of educating college students. This is especially characteristic of the operation of most public colleges and universities. It is not likely that the size or composition of the student body which would result would represent the explicit educational objective of policymakers if they followed the procedure which we proposed above. Most persons familiar with State college and university systems often hear as a justification for low tuition that such a tuition policy opens up the access of higher education to low income students. Yet the reader can see from Figure IV–1 that a decrease in the level of tuition charged at four year public institutions would attract more students from relatively high income families than from relatively low income categories. If the objective is to bring more of the relatively low income students into college a policy of differentially pricing education for students of equal ability but different family income is more appropriate.

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[14] These objectives may be expressed more fully in terms of college achievement as well as college attendance. See Chapter 5 in (6).

[15] A quantified model for the allocation of subsidies to students at the University of California is described in (6).

[16] For more detail on this subject see (6) and (7).

The second method of subsidizing college students, used especially frequently by private institutions, is the so-called financial "need" approach. The objectives of the "need" approach are twofold. First, it is intended to ensure that student subsidies are determined in accord with middle class judgments of the appropriate parental contribution to a child's education, given the family's financial situation. Second, it is intended to prevent competition for students among colleges and universities. This second objective is achieved by the use of a uniform set of rules for financial "need."

When the financial need approach is followed financial aid counsellors determine each student's subsidy using the information on a parent's confidential financial statement in an elaborate formula. Briefly, family income is determined and from it are subtracted expenditures on "necessities." The remainder, referred to as discretionary income, is then "taxed" for the parental contribution. "Necessities" include medical and dental expense, interest expense, and allowances for dependents and extraordinary expenses. There is little explicit accounting for the long-term economic well-being of the parents. As a result subsidies usually are not allocated to students whose parents are in the lowest socioeconomic categories. Rather they are allocated to students whose parents have moderate permanent incomes but who are temporarily having economic difficulties or they are given for what educators term "necessities." The most serious difficulty with the "need" approach to subsidizing college students is the same as the uniformly subsidized tuition approach; subsidies are not based on explicit objectives about the size and composition of college enrollments. Student subsidies are based on other objectives, in particular on beliefs about what parents should pay for their children's education.

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PART V

THE ECONOMIC PROSPECTS FOR PRIVATE INSTITUTIONS OF HIGHER LEARNING

Economic Pressures on the Major Private Universities

William G. Bowen*

INTRODUCTION

The purpose of this paper is to analyze the economic pressures on the major private universities and to indicate the nature and magnitude of the financial problem which they face.

No purpose would be served by attempting to list the particular institutions which fall under the heading of "major private universities." In broad terms, we are concerned with those privately controlled institutions which give considerable stress to graduate education as well as to undergraduate education, which accept responsibility for actively promoting scholarship and research, and which are generally regarded as "national" institutions.

It should be emphasized at the outset that much of the analysis presented here applies, in varying degrees, to public as well as private institutions, and to colleges as well as universities. On the expenditure side, especially in the areas of graduate education and research, the forces which affect the major private universities are very much the same as the forces which affect many of the state-supported universities. At the undergraduate level, there is a particularly close parallel between the factors pushing up instructional costs at the major private universities and the factors which are pushing up costs at liberal arts colleges. On the income side of the ledger, private institutions of all kinds are affected significantly by the general outlook for private philanthropy—and, increasingly, public institutions are also affected by the overall trend in giving to higher education.

Thus, this paper is perhaps best viewed as an attempt to analyze those aspects of the economics of higher education which, in combination, define the circumstances of most of our major private universities. The author has, however, attempted to resist the temptation to draw inferences from this analysis for other kinds of institutions, in part because he is less familiar with them, and in part because it seemed unwise to make a long paper longer yet.

An earlier version of this study was prepared in the Spring of 1967 and published by the Carnegie Commission on Higher Education under the title "The Economics of the Major Private Universities." I wish to thank the Commission for permission to include substantial segments of the original publication in this paper. Apart from changes in wording and the inclusion of somewhat more detail concerning library and com-

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puter costs, there are two principal differences between the Carnegie Commission paper and this one: (1) the Carnegie paper included a section dealing with the nature of the public interest in the major private universities which has been omitted from this version; and (2) whereas the cost data for specific institutions in the Carnegie Commission paper represented the experiences of only three case-study institutions (Chicago-Princeton-Vanderbilt) and ended with figures for 1965–66, this paper also includes cost indices based on the experiences of Columbia, Cornell, Harvard, Stanford, and Yale, as well as Princeton, Chicago, and Vanderbilt, for years 1963–64 through 1967–68 (and in some cases projected 1968–69).*

TRENDS IN EXPENDITURES

The Current Situation

Among persons intimately concerned with the affairs of the private universities, there is a pervasive feeling that current sources of financial support are becoming increasingly inadequate in relation to needs. This is the age of the opinion poll, and if the presidents and trustees of our major private universities were surveyed, it seems certain that an overwhelming majority would endorse the preceding statement—regarding it as, if anything, too weak.[1] Of course, university presidents, no less than coaches, are expected to talk about grim prospects. However, recent statements about the financial difficulties of these institutions have a tone of gravity and a sense of urgency which compel close attention. And, in the opinion of this writer, the facts fully justify serious concern.

Some significant operating deficits have been reported in recent years; close to half a million at Cornell, over half a million at Princeton, nearly one and one-half million at Yale, and over two million at Chicago and Columbia, to cite only a few specific universities for which figures happen to be available. Projections for 1968–69 suggest substantial deficits at other universities including one-half million at Stanford and over two million for the Faculty of Arts and Sciences at Harvard.[2] Even more important than these particular figures is the fact that many institutions have avoided deficits only by declining to undertake financial commitments for which there was a serious need. In this sense, there have been "educational deficits" far in excess of the reported financial deficits.

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*I am indebted to Mrs. Linda Peterson for assembling these new data. Acknowledgments for help received in preparing the original study may be found in the Preface of the Carnegie Commission paper.

[1] In summarizing the results of a poll of 14 college and university presidents conducted by the Council for Financial Aid to Education in the fall of 1965, President Paul Reinert of St. Louis University reported that "the note common to most of the replies was . . . [that] we are worse off than we were ten years ago." (From an address given at a meeting in Philadelphia on May 4, 1966.)

[2] It should also be noted that even larger deficits would be reported by some universities were it not for changes in accounting conventions (such as the modification at one university of the formula used to compute contributions to the major maintenance reserve) and in the definition of endowment income to include some capital gains.

To be sure, no major university has had to close down,[3] and not even the most pessimistic observer would forecast the demise of any of these institutions within the foreseeable future. But survival in some form or other is hardly the test of well-being. The danger is not that the major private universities will disappear, but that they will be unable to continue to meet their current responsibilities, let alone to develop in step with national needs.

Unfortunately for purposes of analysis, the financial health of a university cannot be measured in terms of an easily calculated ratio, such as earnings per share of stock. If a university is in financial straits, this fact is unlikely to be highlighted by declining profits and proxy fights. Financial difficulties are more likely to be reflected in a relatively unspectacular decline in effectiveness, a decline whose onset is marked to the discerning observer only by the things that the institution is not doing which it ought to be doing. Non-profit organizations in all fields—medicine, the arts, social work, education and research—instinctively retrench when faced with the prospect of deficits, generally by failing to accept new obligations and by allowing a deterioration in the standards applied to the tasks already being performed. Given the increasing demands being placed on the entire system of higher education in this country, it would be nothing short of a national tragedy if these institutions were to suffer this kind of fate.

A primary reason why the major universities, public as well as private, need substantial amounts of additional income is that their operating costs have been rising rapidly. To be sure, the level of expenditures depends to a considerable extent on the amount of income available—just as the amount of income available depends to some extent on the strength of the pressures for increased expenditures. The interdependence of the expenditure and income sides of the budget is a basic characteristic of all non-profit organizations, and this characteristic adds to the difficulties involved in analyzing the financial circumstances of educational institutions. These difficulties notwithstanding, it seems worthwhile to examine the sources of upward pressures on expenditures and to hazard some projections. These are the tasks of this section. Then, in the next section, we shall examine trends in traditional sources of income.

General Trends in Expenditures

The most noticeable feature of the budgets of all institutions of higher education is how fast they have gone up in the years since World War II. Total educational and general expenditures on current account[4] by all institutions of higher education went up from less than 1 billion dollars in 1945–46 to more than 7 billion in 1963–64 (the last year for which the Office of Education has published detailed data). Comparable figures for all universities and for all private universities are available only since 1951–52, but even over the 12-year span between that academic year and 1963–64, expenditures by all universities increased from 1.1 to 4.5 billion dollars and expenditures by all private universities increased from less than half a billion to more than 1.5 billion dollars.[5] These trends are shown graphically on Figure 1.[6]

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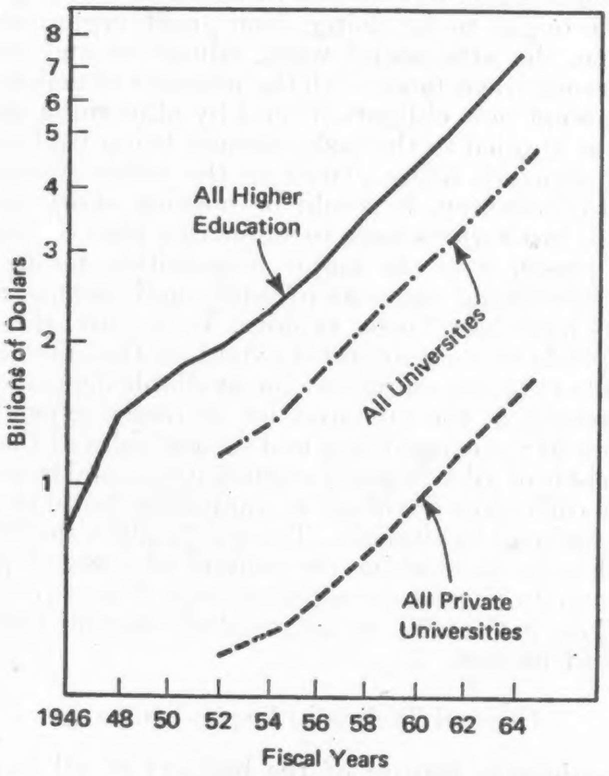
[3] However, there have been a number of instances in which private institutions have been unable to continue to exist as such and have become associated with state systems of higher education—the University of Buffalo and the University of Pittsburgh are two cases in point.

[4] This excludes student aid expenditures and expenditures for the so-called "auxiliary activities" (dormitories, dining halls, athletics, etc.), as well as *all capital expenditures* Expenditures for organized research are included.

Figure I

Educational and General Expenditures by All Institutions of Higher Education, by All Universities, and by All Private Universities, 1945-46 to 1963-64.



Source: U.S. Office of Education, *Digest of Educational Statistics* and *Biennial Survey of Higher Education*, Various years.

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[5] The set of institutions included in these figures is based on the official Office of Education definition of "universities"—"institutions which give considerable stress to graduate instruction, which confer advanced degrees as well as bachelor's degrees in a variety of liberal arts fields, and which have at least two professional schools that are not exclusively technological." In the fall of 1965 there were 155 universities according to the Office of Education publication, *Opening Fall Enrollment in Higher Education*. Separate figures are not given for private universities alone as of the fall of 1965, but figures for the fall of 1963 indicate that at that time there were 58 private universities out of a total of 146 universities.

[6] This figure is plotted on a semi-logarithmic (ratio) scale, so that the reader can compare more readily the percentage rates at which these expenditures have been increasing over different parts of the postwar period. On a semi-log scale, a straight line implies a constant (compound) rate of growth.

The significance of increases in total educational and general expenditures depends in part on their composition. The phenomenal growth of organized research has, of course, been one of the main forces behind the expansion of university budgets, and since direct expenditures on organized research have been financed, not out of general university funds, but out of special monies (overwhelmingly governmental) made available for this purpose, let us subtract these expenditures and see how much of the increase in total expenditures disappears in the process. The results of this exercise for various sets of universities over various time-periods are summarized in Table 1. The top panel of the table shows absolute increases (in millions of dollars), while the bottom panel expresses these figures as average annual percentage rates of increase.

We present separate figures for all universities, for all private universities, and for the composite institution made up from data for our three "case-study" universities (Chicago, Princeton, and Vanderbilt).

TABLE 1.—*Increases in expenditures, by broad categories, F52–F66* [1]

[Dollar amounts in millions]

	All universities (F52–F64)	All private universities (F52–F64)	Chicago-Princeton-Vanderbilt [2] (F56–F66)
I. Absolute increase in:			
1. Total educational and general expenditures (TEGE)	$3,371	$1,124	$96
2. Organized research	1,234	494	43
3. TEGE less organized research	2,136	630	53
4. Direct expenditues on instruction and departmental research	1,030	318	30
II. Average annual rates of increase in (percent): [3]			
1. Total educational and general expenditures (TEGE)	12.0	10.9	(13.9)
2. Organized research	15.6	15.5	(19.2)
3. TEGE less organized research	8.7	7.1	(12.1)
4. Direct expenditures on instruction and departmental research	10.5	8.8	(11.1)

[1] The abbreviation "F52" stands for "fiscal year 1951–52," etc. As indicated in the parentheses under the column headings, the period covered by the figures for Chicago-Princeton-Vanderbilt differs slightly from the period covered by the figures for all univestities and all private universities.

[2] Expenditures on hospitals and clinics have been excluded from these figures.

[3] Calculated between terminal years. The rates for Chicago-Princeton-Vanderbilt are averages of the separate rates of increase for the 3 institutions.

Sources: Figures for all universities and for all private universities were obtained from the sources listed in app. table 1 of the Carnegie Commission paper. Figures for Chicago-Princeton-Vanderbilt were supplied by these institutions.

The main point to note is simply that there is a lot of growth left after the increase in direct expenditures on organized research has been excluded. Total educational and general expenditures less expenditures on organized research (line II.3 in the table) have gone up, on the average, more than 7 percent a year at all private universities and more than 12 percent a year at our three case-study institutions. The subcategory labeled "direct expenditures on instruction and departmental research" serves as an alternative, and in many ways, cleaner measure of trends in instructional costs; and we see from line II.4 of the table that this category of expenditures has increased at an average annual rate of between 8 and 11 percent at our various groups of universities.[7]

More recent figures for an expanded group of case-study institutions (Cornell, Chicago, Columbia, Harvard, Princeton, Stanford, Vanderbilt, and Yale—henceforth referred to as C-C-C-H-P-S-V-Y) confirm the trends revealed by the earlier figures. At this set of institutions, total educational and general expenditures less direct expenditures on organized research went up at an average annual rate of 12.1 percent between 1963–64 and 1967–68.[8]

INCREASES IN COST PER STUDENT

Why have instructional costs risen at such a rapid rate? One part of the answer is of course that enrollments have increased, but increases in the number of students by no means accounts for all of the increases in costs which have occurred.

In Figure 2, we show what has happened to indexes of direct instructional costs *per student* over the period since 1955–56. The index of average cost per student at Chicago-Princeton-Vanderbilt can be seen to have increased at a remarkably steady rate—and to have more than doubled over the 10-year period ending with the year 1965–66. In an effort to see if trends at these three institutions have been at all typical of private universities in general, we constructed a comparable index for all private universities on the basis of data published by the Office of Education. As can been seen from the figure, these two indexes have moved in a strikingly similar way. Since the two indexes span slightly different time periods, quantitative comparisons can be made most easily in terms of average annual rates of increase—which work out to 7.3% for Chicago-Princeton-Vanderbilt and to 8.3% for all private universities.

Again, the more recent figures for the larger set of case-study institutions (C-C-C-H-P-S-V-Y) confirm these findings. In fact, at these institutions, educational and general expenditures per student (ex-

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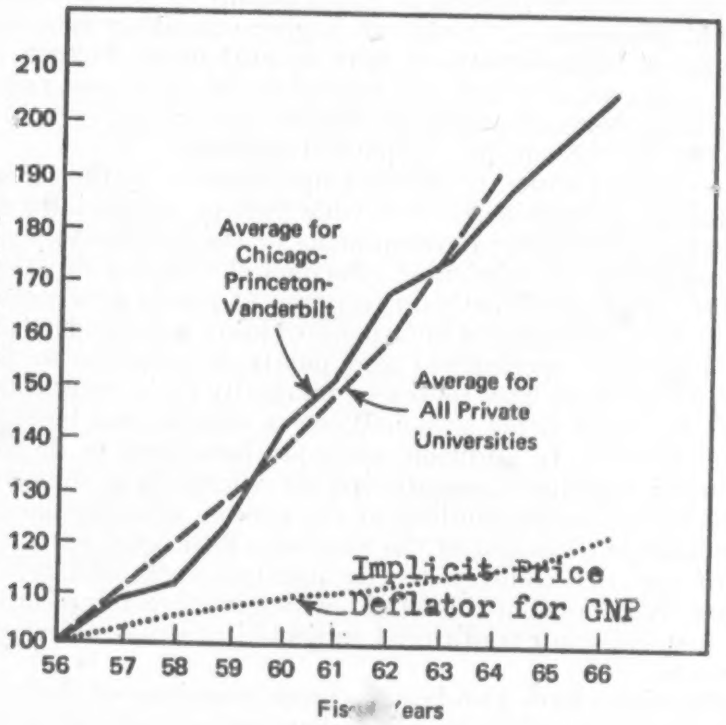
[7] "Direct expenditures on instruction and departmental research" consists mainly of faculty salaries charged to the regular departmental budgets. The phrase "departmental research" is included to reflect the understanding that faculty members with all of their salaries charged to a regular departmental budget are expected to do research as well as to teach. This is a cleaner measure of trends in instructional costs than total educational and general expenditures less direct expenditures on organized research, in that the latter category still includes indirect costs associated with organized research and various other items of expense such as the costs of running university hospitals and clinics. Ideally, one would like to be able to add to direct expenditures on instruction and departmental research an appropriate share of applicable indirect costs, but this cannot be done, given the form of the published data. Some estimates of this kind have been made for two or our case study institutions, however, and they indicate rates of growth which are much the same as the rates of growth for direct expenditures per student.

[8] This average annual rate of increase was calculated by (a) converting the absolute figures for each institution into an index with 1963–64=100, with certain exceptions noted below; (b) averaging the indices for the individual institutions for each year, assigning each institution a weight of one; and (c) taking the total percentage increase for the all-institution index between 1963–64 and 1967–68 (58.3 percent) and expressing it as a compound average annual rate of increase. The only complication arose because of the lack of figures for three institutions for 1963–64. In the case of these institutions, indices were constructed using 1964–65 as the base, with the value in the base year set equal to the average value of the indices for the other institutions in that year. All of the other figures for this set of institutions reported in this revised version of the study were calculated accordingly.

Figure 2

Direct Costs Per Student in Private Universities, Compared with an Economy-wide Cost Index, 1955-56 to 1965-66



cluding organized research) increased at an average annual rate of 8.5 percent between 1963–64 and 1967–68—almost exactly the same rate of increase as the one reported above for all private universities and slightly higher than the rate of increase for Chicago-Princeton-Vanderbilt over the period 1955–56 to 1965–66.

It is instructive to compare these average rates of increase in cost per student with trends in the unit costs of other goods and services in the economy. The best overall index of cost trends throughout the economy is the implicit price deflator for the gross national product, and this index, converted to the same 1955–56 base as our measures of cost per student, is also plotted on Figure 2. It is evident that instructional costs per student have risen much faster than costs in general. Indeed, our economywide index of costs has risen at an average annual rate of only 2.0%, compared with the average annual rate of increase of around 8% in instructional costs per student. Clearly, general inflationary tendencies and increased enrollments together explain only a minor part of the upward trend in expenditures.

REASONS FOR RISING COSTS: INCREASED RESPONSIBILITIES OF THE UNIVERSITIES

In the next section it is argued that, as a result of the technology of higher education, there is an inexorable tendency for cost per student to rise relative to costs in general, and that an understanding of the nature of this process is fundamental to any assessment of the financial prospects of American higher education as a whole. First, however, it is important to note several other factors making for higher costs, all of which are related to the increased responsibilities which have been accepted by institutions of higher education, and especially by the nation's major universities.

Instructional costs are affected significantly by the extent to which institutions attempt to cover a wide variety of specialized fields, and one of the noteworthy developments of the last 10–15 years has been the broadening of curricular offerings and the establishment of new research programs. Partly in response to purely intellectual developments (the splintering of some fields of knowledge and the development of entirely new specialties) and partly in response to felt national needs, universities have increased markedly their commitments to such relatively costly fields as non-Western studies and biochemistry and plasma physics. In addition, attempts have been made to strengthen and bring together those disciplines which have something to contribute to our understanding of the process of economic development and modernization and of the problems associated with the urbanization of our own country, to cite just two areas of inter-disciplinary concern. All efforts of this kind—which involve doing something more than just studying traditional subjects in traditional ways—are very expensive.

Universities have also become more conscious of their responsibilities to the communities in which they are located, and of their responsibilities for aiding in the achievement of national goals. Universities as institutions have participated in programs ranging from the training of Peace Corps volunteers, to the staffing of summer institutes for secondary school teachers, to urban renewal. Individual faculty members and administrative officers have been called on repeatedly to assist in the development and implementation of public policies in almost every conceivable field. Such efforts have been costly in terms of time spent and administrative energy, not to mention unreimbursed costs.

Even in the performance of traditional functions within traditional fields, advances in knowledge and in research techniques have made it increasingly expensive to do the job. The rapid rate of publication of new books and journal articles, along with increases in the cost of an individual acquisition, have caused library costs to soar. In the most recent four-year period for which data are available (1963–64 to 1967–68), library costs at our larger set of case-study institutions increased at a compound average annual rate of 19 percent—which is equivalent to a doubling over this period! Another calculation, covering an earlier time period and more "large" libraries, revealed an average annual increase of 15 percent.[9] In spite of these rates of increase, there is increasing concern over the adequacy of many of our leading libraries.[10]

The emergence of the computer as an indispensable tool for research and teaching in fields ranging from linguistics to high-energy physics has been another important source of higher costs. To be sure, computers are a cost-reducing innovation in the sense that they make it possible to perform operations much more rapidly than would otherwise be possible. Hence in the case of research work, what computers have done is not so much replace less efficient methods of numerical analysis as make it possible to do things which otherwise would have been impractical. Thus, by permitting new departures in research and teaching, computer technology has meant increased costs, not cost savings. At the larger group of case-study institutions, computer costs—excluding capital outlays—tripled between 1963–64 and 1967–68. And, lest anyone think this is attributable simply to a low level of expenditure in the base year of 1963–64, it is worth reporting that the rate of increase between 1966–67 and 1967–68 averaged 29 percent at these eight universities.

Still another factor which has caused increases in average instructional cost per student is the changing "mix" of the student body at the typical university. Graduate students, and especially Ph.D. candidates, are much more expensive to educate than are undergraduates,[11] and the share of the total student population made up of graduate students has increased markedly. For all universities, the ratio of graduate students to total students was almost exactly the same in the fall of 1963 as in the fall of 1955 (16.8% and 16.3%, respectively); but for all private universities, this ratio increased from 18.2% to 23.9% over this time span. And for our three case-study institutions, the percentage of graduate students to total students increased from 45.7% in 1955–56 to 51.3% in 1965–66.

The increased emphasis on graduate education has been accompanied by an increased emphasis on research at many of the major universities, as one would expect, in view of the close interrelationship between these activities. Even in the sciences, outside funds have covered only part of the increased costs involved in supporting this larger research effort, and in the humanities and social sciences internal sources have been called on to provide a very high proportion of the funds required.

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[9] The 15 percent rate-of-growth figure was calculated from *The Past and Likely Future of 58 Research Libraries, 1951–1980,* by O. C. Dunn, W. F. Seibert, and Janice A. Scheuneman, Purdue University, 1967. The figure is for "large" libraries.

[10] Indicative of this concern is the recent appointment by the American Council of Learned Societies of a committee of scholars, librarians, and university presidents to propose programs of action to meet the urgent and long-term needs of American research libraries. The study is being made at the request of the National Advisory Commission on Libraries, which was established by Executive Order in September, 1966.

[11] It is impossible, on the basis of the official figures published by the Office of Education, to offer any overall quantitative estimates of the relative costs of undergraduate and graduate instruction. However, a detailed examination of expenditure data for Chicago suggests that the average instructional cost per graduate student ranges anywhere from 2 to 5 times as much as the average instructional cost per undergraduate, depending on the field of graduate study used to make the comparison. The University of Michigan, in a statement about its proposed 1966–67 budget, reported an average cost figure for Master's degree candidates which was nearly twice as high as the comparable figure for undergraduates and an average cost figure for Ph.D. candidates which was roughly 4 times as high as the undergraduate figure.

REASONS FOR RISING COSTS: THE TECHNOLOGY OF EDUCATION [12]

At the root of the cost pressures besetting all educational institutions is the nature of their technology. Here lies a more fundamental explanation for the tendency for costs per student to rise relative to costs in general than any of the reasons discussed in the previous section. It is more fundamental because the economic implications of the technology of education would lead us to expect costs per student to rise inexorably even if universities avoided all temptations to embrace new fields and new techniques, to accept broader responsibilities in the world at large, to educate more graduate students relative to undergraduates, and to do more research. That is, even if universities were content to turn out the same "product" year after year, they would still be subject to increasingly severe cost pressures.

The Productivity Problem.—Over the course of the twentieth century, output per man-hour of labor input (the usual measure of productivity) in the United States has gone up at a remarkably steady rate at approximately 2½ percent per year. Even in the absence of reliable statistics, it seems safe to assert that educational institutions have not shared fully in this growth in the overall productivity of the economy. The factors primarily responsible for productivity gains—new technology, an increasing stock of physical and human capital, and economies of large-scale production—have simply not affected the education "industry" to anything like the extent to which they have affected, say the automobile industry.

To be sure, educational institutions have benefited from such technological innovations. Air conditioning has made it possible to operate schools on a year-round basis. Administrative operations have benefited from new types of office equipment (though probably not nearly as fully as they should have), and so on. But these developments have been sporadic and have had little direct effect on the productivity of the individual faculty member, who is, if you will, the principal "labor input" in the educational process. The microphone (or public address system) is perhaps the most important technological development which has affected the productivity of the teacher since the invention of the printing press, and no one would claim that this device has had an effect on output per man-hour in the field of education which is at all comparable to the effects of the major technological innovations in other sectors of the economy.

Nor is it just limited opportunities for techological change which retard the rate of productivity increase in education relative to other industries. In manufacturing, capital accumulation (the provision of more machines and equipment of existing types) has led to significant increases in the amount of output produced per unit of labor input. But what is the analogue in education? Two microphones per teacher?

This is certainly not meant to imply that increased efficiency and innovation are impossible in education. It seems clear, for example, that substantial economies of scale exist, at least at some levels of the educational process, and that increases in the scale of operations of some educational institutions have led to increased ouput per unit of labor input.

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[12] This discussion draws heavily on the analysis of the economic problems of the performing arts which the author of this report did in collaboration with William J. Baumot. See *Performing Arts: The Economic Dilemma* Twentieth Century Fund. 1966, especially Chapter VII. There are strong similarities between the economic problems of the live performing arts and the economic problems of educational institutions.

A much more important possibility for the future is of course the use of television, computer-assisted instruction, and various kinds of teaching machines. The future implications of these electronic aids will be considered later in this paper, when we hazard some projections. However, while such innovations may have considerable applicability at certain levels of education, it seems unlikely that they will reduce appreciably the time faculty members must spend with advanced students and on their own research. Over the long-run, even if the universities were to have the most progressive leadership and were to shed many of their conservative biases, the odds seem slim indeed that they can hope to match the remarkable record of productivity growth achieved by the economy as a whole.

The relationship between productivity and costs.—And, it is the ability of the universities to keep pace, year after year, with economy-wide productivity gains which is crucial for their cost position. To appreciate these relationships it is necessary to consider in general terms what differential rates of growth in productivity imply for relative costs.

Let us imagine an economy divided into two sectors, one in which productivity is rising and another in which it is constant, the first producing automobiles, and the second, "education" (defined as some amalgam of students and knowledge [13]). Let us suppose that an automobile production output per man-hour increases at an annual rate of 4 percent, compared with a zero rate of increase in the education industry. Now, let us assume that money wages in the automobile industry go up at the same rate as productivity in that industry. This means that each year the typical auto worker's wage goes up by 4 percent, but since his output increases by exactly the same percentage, the labor cost of manufacturing a car will be unchanged. This process can continue indefinitely, with auto workers earning more and more each year, with costs per car remaining stationary, and with no rise in automobile prices necessary to maintain company profits.

But what about the education industry? How it fares in this imaginary economy depends on what assumption is made about the relationship between increases in faculty salaries (treated, for the sake of simpilicity, as an index of all salaries in the education industry) and the increases in the wages of auto workers. Over the long-run, it is probably most reasonable to assume that faculty salaries increase at approximately the same rate as wages in other sectors. (Between 1948 and 1966, professorial salaries have increased slightly faster than earnings of production workers in manufacturing—4.8 percent per year for the former and 4.2 percent for the latter. However, if we take either 1929 or 1939 as our base year, we find that faculty salaries have increased somewhat less rapidly than earnings in manufacturing. It was during the World War II period that the relative income position of faculty members deteriorated so markedly.)[14]

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[13] Here, as elsewhere in this paper, the exceedingly difficult problem of how one defines the "output" of universities is dodged. It is easy enough to say that universities educate students, create and preserve knowledge and, to an increasing extent, perform these traditional functions in ways intended also to advance the welfare of neighboring communities and society at large. It is far more difficult to measure the degree to which any of these objectives is achieved, let alone measure all of them in ways which permit one to estimate a "total product." One major disadvantage of cost-per-student figures is that the use of such a ratio may lead some to think that the education of students is the only objective of a university. This is obviously not true, but it is far from clear how one even approximates the other "products" of a university without defining them in terms of inputs rather than outputs. Even if universities existed solely to educate students, we would want a measure of output expressed in qualitative as well as quantitative terms, and here again it is by no means obvious how to proceed. As Professor Rendigs Fels of Vanderbilt has suggested (in correspondence with the author) the real costs of a unit of educational product defined in terms of a fixed standard of quality may well have gone up considerably less rapidly than the crude indexes we can compute. The difficulties of allowing for variations in quality which plague the construction of cost and price indices of all kinds apply with special force to the field of education.

If the salary of the typical faculty member does increase at an annual rate of 4 percent, so that his living standard improves along with the living standard of the auto worker, but if output per man-hour the education industry remains constant, it follows that the labor cost per unit of educational output must also rise 4 percent per year. *And there is nothing in the nature of the situation to prevent educational cost per unit of product from rising indefinitely at a compound rate of this sort.*

The particular assumptions included in this analysis are of course merely illustrative, and the numerical results can be changed by assuming a different rate of productivity increase and a different rate of increase of money wages in the non-educational sector, by assuming that faculty salaries increase at a somewhat different rate from money wages in general (either faster or slower), and by allowing for some increase in productivity in the field of education. But modifications of this kind will not alter the fundamental point of the argument, which is that *in every industry in which increases in productivity come more slowly than in the economy as a whole, cost per unit of product must be expected to increase relative to costs in general.* Any product of this kind—whether it be a haircut, a custom-prepared meal, a performance of a symphony concert, or the education of a graduate student—is bound to become ever more expensive relative to other things.[15]

There is an important corollary to this fundamental point: the extent of the increase in relative costs in those industries where gains in productivity are hard to obtain will vary directly with the economy-wide rate of increase in productivity. That is, the faster the overall pace of technological progress and capital accumulation, the greater will be the increase in the general wage level, and the greater will be the upward pressure on costs in industries in which productivity is more or less stationary. Faster technological progress is no blessing for the laggards, at least as far as their costs are concerned. And in this connection it is relevant to note that output per man-hour in the private sector of the U.S. economy has been increasing somewhat more rapidly in the years since World War II than in the earlier part of the century.

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[14] The average annual growth rate of 4.8 percent per year for professional salaries between 1948 and 1966 is based on AAUP data for the average salaries of full professors at the 36 biennial survey institutions. The growth rate for production workers in manufacturing was calculated from figures on gross weekly earnings published in *Economic Report of the President,* January 1967. The data underlying the assertions about growth rates using 1939 as the base year are from the same sources. When we go back to 1929, the same series for wages in manufacturing can be used, but it is necessary to replace the AAUP salary index with data for faculty members at all ranks published in *Historical Statistics of the United States* (column D729).

[15] Statistical evidence supporting this general proposition is summarized in the Baumol-Bowen study of the performing arts cited earlier; see especially pp. 179–180 and Chapter VIII.

THE HISTORICAL RECORD OF COST PER STUDENT

In the specific case of education, figures already presented (see Figure 2) show vividly that average cost per student has in fact gone up much faster than costs in general over the last 10 years. If this result is in good part attributable to the productivity-cost nexus described above, a similar pattern should also be evident for earlier periods. To test this proposition, we constructed an index of cost per student for two of our case-study institutions[16] going back to the first decade of the twentieth century, and an economy-wide cost index covering the same period.[17]

The results are plotted in Figure 3. Between 1905 and 1966, our index of educational cost per student increased 20-fold, whereas our economy-wide cost index increased between 3- and 4-fold.[18] As the graph indicates, neither index marches forward at a nice regular cadence (though the increase in cost per student is clearly steadier than the movements in the economy-wide cost index), and it is instructive to subdivide this long period into sub-periods for further analysis. Table 2 contains a summary of average annual rates of increase in cost per student and in costs in general for the periods of the two world wars, the depression of the 1930's, and three "normal" peacetime periods.

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[16] Princeton and Vanderbilt. Figures for Chicago for the earlier years could not be obtained in time to include them in this set of calculations. Data for Chicago are, however, included in that portion of the index covering the period 1948–49 through 1965–66.

As in the case of the calculations reported earlier, separate measures of direct cost per student were calculated at each institution by dividing expenditures on instruction and departmental research by total enrollment. As noted earlier, it would have been better to divide expenditures on instruction and departmental research *plus applicable indirect costs* by enrollment, but there was no way to estimate the indirect costs. Since our concern here is with trends in costs, not in their level at any point in time, our inability to include indirect costs will not matter so long as the ratio of direct to indirect costs has not varied systematically over the period in question. It seems unlikely that any such variations have been either large enough or systematic enough to affect the general order of the results.

These dollar figures were then expressed as index numbers for each institution. The last step in the calculation was to average the separate indexes to obtain the overall index plotted on the figure. In order to combine the figures for Chicago, which cover only the latter part of the period, with the indexes for the other institutions, the value of the Chicago index in 1948–49 was set equal to the average of the Princeton-Vanderbilt indexes in that year. This serves to prevent our overall index, which is meant to show the rate of *change* in costs, from being affected by differences in the *level* of costs between institutions.

[17] The economy-wide cost index is the implicit price deflator for the gross national product for the years since 1929. For years prior to 1929, we used the wholesale price index. There is no pure cost index available, and so we had no choice but to substitute a general price index. For our purposes, however, this should be quite satisfactory, since a price index will move differently from a cost index only if the ratio of price to profit-per-unit changes; and, over the long period covered here, changes in this ratio have surely not been sufficiently drastic to produce anything approaching a serious distortion in the trend.

[18] This graph, like Figure 1, is plotted on a semi-logarithmic scale, which serves to compress absolute differences more sharply the higher up the scale one goes. Hence, at first blush it may not look as if the differences in the 1966 values of the two indexes are this great.

Figure 3

Direct Costs Per Student, Compared with an Economy-Wide Cost Index, 1905 = 100

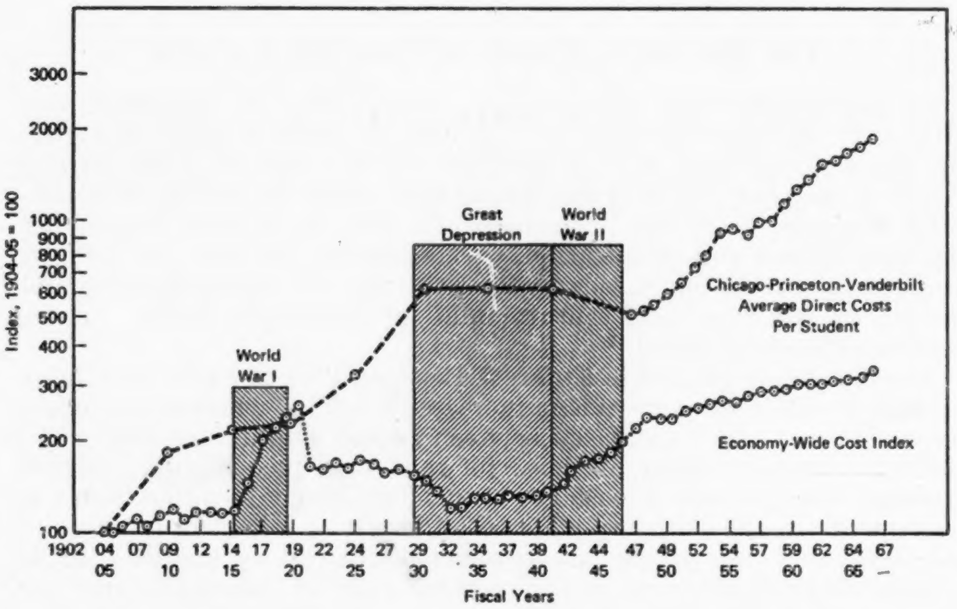

TABLE 2.—*Trends in direct costs per student, compared with an economywide cost index, selected periods, 1905–66*

Time period	Average annual percentage increase (compound rate)[1]	
	Direct costs per student at Chicago-Princeton-Vanderbilt[2]	Economywide cost index
Long-period comparison: 1905–66	5.2	2.1
Wartime inflations:		
1915–20	.8	4.0
1940–48	1.8	7.7
Depressions: 1930–40	0	−1.0
"Normal," peacetime periods:		
1905–15	8.1	1.5
1920–25[3]	7.7	1.5
1949–66	7.5	2.2

[1] Calculated between terminal years.

[2] As explained in app. table 1, Chicago is included in the average only for the years since 1955–56.

[3] The rate for the cost index is based on the years 1921 to 1925, to avoid using 1920, when there was an extraordinary peak in the series, as a terminal year.

Source: See app. table 1 of the Carnegie Commission paper for sources of data, definitions of concepts, and the values for each year.

Only in the case of the war-time periods does the economy-wide cost index rise more rapidly than the index of educational costs per student. An important part of the explanation for the unique war-time pattern is that universities simply do not use many of the commodities (especially raw materials) whose prices are bid up so rapidly when wars occur. A second consideration is that earnings in most salaried occupations are notoriously slow to respond to rapid inflationary or deflationary movements—they are "sticky". As has already been noted, this is an apt characterization of faculty salaries during the World War II period and its inflationary aftermath.

For these two reasons, one might have expected university costs to lag behind costs in general during war-time inflations—but our index of educational cost per student was actually *lower* in 1948 than in 1940, and the considerations noted above certainly do not explain this result. What does explain it is the extraordinary increase in the student population which occurred after 1945, when the veterans enrolled.[19] This enrollment bulge was accompanied by a significant drop in cost *per student*, partly because some genuine economies of scale were achieved, and partly because institutions adopted all kinds of temporary expedients to cope with what was an emergency situation. The leveling off of increases in cost per student between 1954 and 1956 can be explained analogously, in terms of the flow of Korean War veterans into the universities.

It is the "normal" peacetime periods which are most important from the standpoint of understanding the basic cost relationships. In all three such periods for which we have data (1905–1915, 1920–1929, and 1949–1966), cost per student rose substantially more than our economy-wide cost index. Indeed, the remarkable thing about our results for these three peacetime periods is that the numerical values of the compound growth rates for both our economy-wide cost index and our index of cost per student are so similar—the former ranging from 1.5 to 2.2 percent per annum, and the latter ranging from 7.5 to 8.1 percent per annum.

The general conclusion to be drawn from this analysis is that the available data are strikingly consistent with the proposition (developed in the previous section) about trends in the unit cost of education relative to the unit costs of other goods and services. The fact that cost per student increased so much faster than costs in general over the two pre-World War II periods, as well as over the more recent period, suggests that we are observing a pattern attributable to relationships between productivity and costs which are deeply imbedded in the economic order.

There is also an interesting conclusion to be drawn from the relationship between the size of the average rate of increase in cost per student and the magnitude of the average rate of increase in faculty salaries. We noted earlier that faculty salaries have gone up at an average rate of just under 5 percent per year since the end of World War II, and we now see that over this same period cost per student has increased even faster—roughly 7-1/2 percent per year. The simple analytical model described above implies that if there were no increase in output per man-hour in the universities, and if the "product" turned out by the universities did not change, cost per student should increase at about the same rate as the faculty salary scale. The fact that cost per student has gone up faster than the salary of the typical professor means that, whatever increase in output per man-hour has occurred, it has been more than offset by forces making for a more expensive educational product (increasing coverage of specialized fields and an increasing proportion of graduate students being two such forces). Thus, part of the increase in cost per student—perhaps one-third—can be regarded as reflecting the costs of a more elaborate (and presumably more valuable) educational product. Unfortunately, however, expenditures of this kind do not finance themselves any more automatically than expenditures which serve simply to enable institutions to maintain past programs.[20]

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[19] Opening fall enrollment at all institutions of higher education almost doubled between 1945 and 1946, increasing from 1,074,000 to 2,078,000. U.S. Office of Education Circular, *Opening (Fall) Enrollment in Higher Education.*

COMPARING COST INCREASES IN MAJOR PRIVATE UNIVERSITIES WITH COST INCREASES IN BRITISH UNIVERSITIES AND IN ALL OF AMERICAN HIGHER EDUCATION

Now that we have considered in some detail the factors responsible for the steady upward trend in cost per student at our illustrative set of major private universities, it is informative to compare the experience of these institutions with trends in cost per student for two broader sets of institutions: British universities considered as a group and all institutions of higher education in this country. Because of data limitations, these comparisons are confined to the period since the end of World War II. The figures, expressed in index number form to facilitate comparisons of rates of increase, are shown in Figure 4.[21]

At least as important as the differences among these institutions is the one basic point of similarity: cost per student has risen steadily for all three groups of institutions, and at a considerably faster rate than costs in general. Economy-wide cost indexes for the U.S. and for Britain have been left off this figure to avoid clutter. We saw earlier that in the U.S. costs in general have risen about 2 percent per year; in Britain, the average rate of increase has been higher (over 3 percent per year), but this rate of increase has still been *far* smaller than the rate of increase in cost per student. This result is precisely what the logic of the argument concerning the relationship between productivity changes and cost increases would lead us to expect, and the fundamental nature of this source of pressure on educational costs is revealed clearly by the presence of this pattern in the data for all British universities and for all institutions of higher education in the United States, as well as in the data for Chicago-Princeton-Vanderbilt.

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[20] The differences between the growth rates for cost per student and for average professorial salary can also be interpreted as reflecting ever increasing waste and inefficiency, rather than a more valuable educational product. But it seems doubtful that even the harshest critic of the ways universities manage their affairs would argue that inefficiency has been increasing ever since World War II at a compound rate!

[21] The index for Chicago-Princeton-Vanderbilt shown here is the same as the index shown in Figure 3 except that it has been converted to a 1948=100 base. (Note also that Figure 4 is drawn on a regular scale, whereas a semi-log scale was used in Figure 3.)

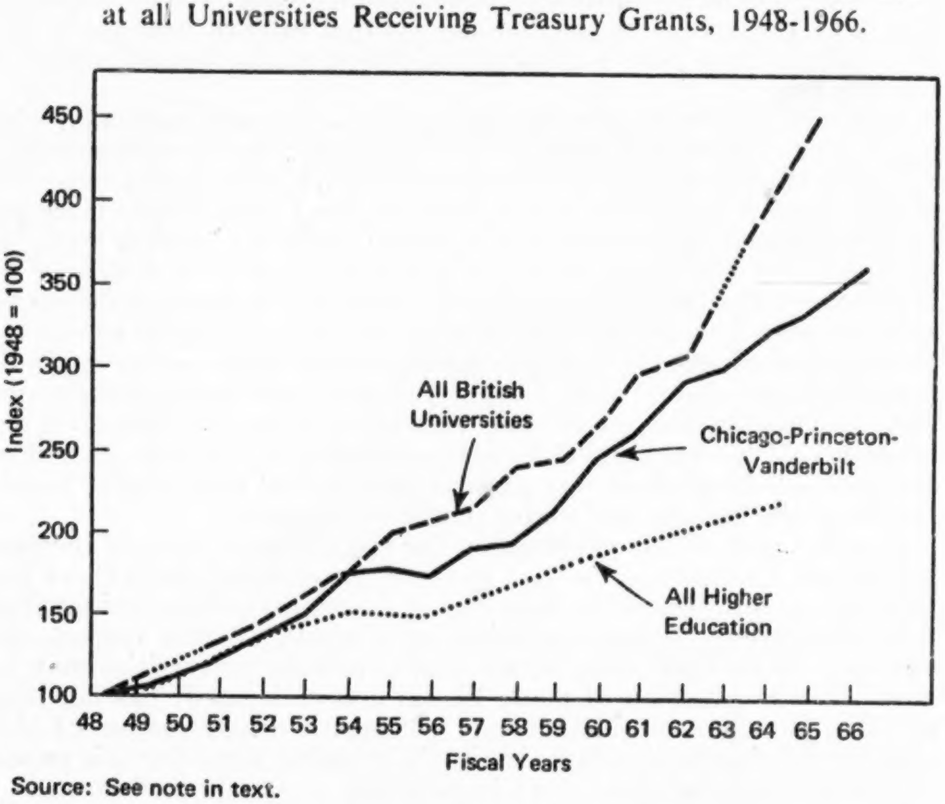
The index for Britain is based on aggregative data for all British universities receiving Treasury Grants, presented in University Grants Committee, *Returns From Universities and University Colleges*, various years. The cost per student measure was obtained by dividing expenditures on what is called "Departmental Maintenance" (includes salaries of teaching and research staff plus costs of maintaining laboratories, lecture rooms, etc.) by the number of full-time equivalent students (counting 2 part-time students as 1 full-time student).

The index for all institutions of higher education in the United States is based on aggregative figures published by the Office of Education. The measure of changes in cost per student for this whole set of institutions was constructed so as to be as comparable as possible with the measure for each of our three case-study institutions—that is, current expenditures on instruction and departmental research were divided by total enrollment (opening full-time, degree-credit enrollment).

In terms of size, rates of expansion, and general characteristics, the British universities probably have more in common with the major private universities in this country than with our system of higher education as a whole (which of course includes two-year institutions and liberal arts colleges, as well as the large state universities), and so it is perhaps not surprising that the cost index for the British univer-

Figure 4

Increases in Cost Per Student at Chicago-Princeton-Vanderbilt, at all Institutions of Higher Education in the United States, and at all Universities Receiving Treasury Grants, 1948-1966.



Source: See note in text.

sities behaves more like the index for Chicago-Princeton-Vanderbilt than like the index for all of American higher education. The fact that the cost index for the British universities has risen even faster than the index for Chicago-Princeton-Vanderbilt is probably explainable mainly in terms of the somewhat faster rate of increase in wages and prices in general in Britain than in the United States.

A detailed analysis of the reasons why cost per student has risen faster at Chicago-Princeton-Vanderbilt than at all institutions of higher education in this country (the respective average annual rates of increase are 7½ percent and 5 percent) is plainly beyond the scope of this paper. However, there are certain strands to the explanation which are directly related to our previous discussion of the reasons for rising costs at the major private universities.

To begin with a negative observation, we know that the explanation does not run in terms of differential rates of increase in faculty salaries. The AAUP surveys cited earlier suggest that rates of increase in faculty salaries have been remarkably uniform among broad groups of institutions.

It was noted earlier that the rapidly increased costs associated with graduate education and research (exclusive of "organized research"), and with the increased emphasis on these activities at institutions such as Chicago-Princeton-Vanderbilt, have required considerable increases in expenditures, and these factors no doubt account, in part at least, for the somewhat faster rate of increase in cost per student at this set of institutions. The costs of graduate education and research at the major state-supported universities have of course been subjected to exactly the same pressures. However, this rapidly rising component of expenditures has been (and is) small relative to total expenditures at the major state universities because of their extremely large undergraduate enrollments. If it were possible to compare trends in costs per student *at the graduate level alone*, one might expect to find very similar trends for the major private and major public universities.

Another part of the explanation for the different rates of increase in cost per student may be that at the undergraduate level there has been less of an increase in class size at the major private universities than throughout higher education as a whole. In this respect, the situation of at least some of the major private universities may be most like the situation of many liberal arts colleges. It has not been possible, however, to include any systematic investigation of this question of changes in class size in the research done for this paper, and so this "explanation" must be regarded as purely conjectural.

There is a final point to be made about the differential in rates of increase in cost per student, and it has to do with the effects of changes in the distribution of students among institutions. The composite index of cost per student for Chicago-Princeton-Vanderbilt was built up from data for the separate universities so as to prevent changes in the relative size of these institutions from affecting the measure of average increases in cost per student. The data for all of higher education, on the other hand, are aggregative data, and so are affected by changes in the relative numerical importance of different institutions. Thus, still another part of the explanation for the slower rate of increase in this aggregative measure of cost per student is the fact that there has undoubtedly been a tendency for enrollment at the less expensive institutions to grow relatively rapidly. There is evidence to suggest that this consideration does not explain all of the differential rate of increase shown in Figure 4,[22] but it certainly explains some part of it.

This completes our analysis of trends in cost per student. We turn now to the task of making some crude projections of future expeditures at our "representative" major private university.

Projecting Expenditures [23]

The task of projecting the course of educational expenditures is usually approached in two steps: (1) project average cost per student; and (2) project future enrollment. This is the procedure followed in arriving at the extremely crude figures presented below, but it should be recognized that it suffers from the defect of being based on the assumption that average cost per student and the number of students are independent of one another. This is clearly not true, even in the long run, but to deal successfully with the relationship between changes in the size (and composition) of the student body and cost per student would require a much more detailed analysis than is possible here. So long as enrollment continues to increase at a fairly steady rate, more or less consistent with the rate of increase characteristic of the period used to estimate trends in cost per student, our inability to distinguish a "pure" estimate of cost per student (assuming no change in enrollment) from the trend estimate (assuming some increase in enrollment) will not distort the results appreciably. However, if a significant, unanticipated slowing down in the rate of increase in enrollment should occur, we should revise upward our anticipated rate of increase in cost per student to reflect the loss of some economies of scale.

The simplest way of projecting average cost per student is to extrapolate the rate of growth which has prevailed in prior years, and this is the tack taken here. We shall assume that average cost per student rises at the (compound) rate of 7½ percent per annum through 1975–76 (the terminal year for these calculations). One justification for this key assumption is the extraordinarily persistent way in which direct costs per student have increased at roughly this rate over the last 18 years (see Figures 2 and 3 and Table 2).[24] Another justification is that the considerations advanced to explain this historical pattern of growth seem likely, with a few modifications noted below, to apply to the future as well.

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[22] For example, excluding two-year institutions from the figures—and thus eliminating the effects of shifts toward this relatively inexpensive form of higher education—makes less of a difference than one might have expected. The rate of increase in cost per student at all 4-year institutions of higher education is very similar to the rate of increase for all higher education, and is still much lower than the rate of increase for all private universities.

[23] Expenditures on organized research are excluded from this discussion because: (a) their future magnitude depends heavily on special consideration which are hard to incorporate into statistical projections; and (b) they are largely financed by earmarked funds and so have different implications for general university finances than do other expenditures. This is not to say, however, that the financial health of a university is not affected significantly by its organized research activities. Recent cut-backs in the rate of increase of research support for science have affected both the scientific capabilities of universities and their overall financial position. The adverse effects on general finances are attributable in large part to the difficulties of reversing decisions—for example, to air condition space needed for government-sponsored research, to improve accounting procedures, and so on. The associated increases in operating expenses must still be met even though there is a reduction in income anticipated from sponsored projects.

If anything, there seems to be an increasing need for universities to strengthen their libraries, to move aggressively into new (and costly) fields of teaching and research, to provide more graduate education relative to undergraduate education, and to participate actively in the quest for solutions to national and international problems. Needless to say, all of these factors imply significantly higher expenditures per student, even if there were *no* increases in salaries or in the other costs of doing the present job.

In fact, salaries of all persons on university payrolls, from faculty members to administrative officers to secretaries to custodians, must be expected to increase. Salaries paid to faculty members are an especially important component of university budgets, and implicit within the projected 7½ percent per annum increase in cost per student is the assumption that faculty salary scales will continue to increase at the average rate for the period since 1948—a little less than 5 percent per year. There is some basis for questioning this assumption, however. Allan Cartter has estimated that the demand for new doctorates is likely to decline somewhat over the next few years, as the rate of expansion in total enrollment declines; over the same period, the number of doctorates awarded will increase.[25]

The obvious implication would seem to be that market forces will exert less upward pressure on faculty salaries in the next decade than in the past decade. However, the non-academic demand for persons holding Ph.D. degrees may well increase even more sharply than Cartter assumes; and it is also likely (as Cartter notes) that schools which have had to settle for faculty members without Ph.D. training in recent years will increase their demand for new Ph.D.'s in an effort to upgrade their faculties. All in all, it seems unlikely that faculty salaries will rise less than 4 percent per year, and the roughly 5 percent rate may well be maintained. The 5 percent per annum rate of increase is actually a bit below the rates of increase reported for the last several years by the AAUP, and so does allow for some easing of current upward pressure on faculty salaries.

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[24] There is one specific issue involved in the selection of the 7½% figure as representative of the historical rate of increase, and that concerns the behavior of our cost per student index in the last few years. Close inspection of Figure 3 (which is better for this purpose than Figure 4) reveals a tendency for the rate of increase in average cost per student to have been somewhat lower in the most recent years than over a longer period (say the last decade or the whole period since the end of World War II). It would probably be a mistake, however, to use only the experience of these last few years as the basis for projecting cost per student.

This judgment is based, first, on the general principle that it is dangerous to make too much of a few observations, especially when they pertain to only three institutions. Reinforcing this general principle are some specific facts—namely, (1) the composite cost index was pulled down sharply in the terminal year by abnormally sharp increases in enrollment at two of our three case-study institutions; and (2) a comparison of the behavior of the cost per student index at Chicago-Princeton-Vanderbilt with the cost per student index for all private universities (see Figure 2) also suggests that the three-institution index, while remarkably representative of the experience of all private universities over the whole of the postwar period, does understate the general increases in cost per student over the last few years for which we have comparable data. This interpretation is supported by the new figures obtained for a larger set of case study institutions (C-C-C-H-P-S-V-Y) covering more recent years. As noted earlier, cost per student at this composite set of institutions has been increasing about 8 percent a year.

It should be added that even if we were to accept the values of our three-institution index for the last few years at face-value, and were to base our projection solely on these data, we would get a rate of increase which was only about one and one-third percentage points lower than the 7.5 rate. (Between 1961 and 1966, the average annual rate of increase was 6.2 percent per year.)

And it is even more important to recognize that there is an obverse side to this entire discussion. If the value of our cost per student index in 1965–66 is too low (as we think it is, primarily because of the effects of sudden jumps in enrollment at two of the institutions, but perhaps also in part because of increasing financial pressures which served to depress expenditures per student), using this value as the terminal year for the calculation of an average rate of increase in cost per student will produce too low an estimate. It may be that 8 or 8½ percent per year would have been a better figure. In the absence of the case-study data for additional universities which would be necessary to make progress in resolving this question, it seems most advisable to use the 7½ percent rate, recognizing that it is if anything more likely to be a bit too low than a bit too high.

[25] See his "The Supply and Demand of College Teachers," in the 1965 Social Statistics Section *Proceedings* of the American Statistical Association. See also the paper by Cartter and Farrell in this volume.

Given the highly approximate nature of the projections being made here, it would smack of specious precision to present alternative calculations assuming that faculty salaries go up, say 4 percent a year rather than roughly 5 percent. In thinking about the order of magnitude of the savings which would result, however, it is important to remember that faculty salaries do not comprise all of the salary budget.

Even if faculty salaries grow at a little slower rate than in the past, it does not follow that non-faculty salaries will also increase less rapidly in the future than they have in the past. Unfortunately, no detailed information on non-faculty salaries is available, but it does seem clear that institutions of higher education have been very slow to increase the wages of administrative, clerical, and other supporting staff—not because of any lack of desire to "do the right thing," but simply because of financial constraints. Whether universities can continue to recruit and retain the non-faculty personnel they need without increasing salary scales marketedly is an open question. And an increasing need to pay competitive salaries to non-faculty personnel could more than offset any tendency for the rate of increase in faculty salaries to slow down.

Furthermore, the general inflationary pressures of the last two years, which are much more apparent now than when the projections reported below were originally prepared, have become an important consideration in salary policy. In view of the increases in living costs and in the rates of pay of persons in other sectors of the economy, it seems unlikely that the overall rate of increase of university salaries can be held below 6 percent, at least over the next few years, and it may be higher.

Another key assumption behind the projected 7½ percent per annum increase in cost per student is that there will be no dramatic changes in the educational process which will, within the next 10 years, alter appreciably the historical rate of increase in output per man-hour. Increases in class size have no doubt been the principal means of securing increases in output per man-hour,[26] and the straight-line method of extrapolating past rates of increase in cost per student implicitly assumes the continuation of this trend. This observer's guess is that the upward trend in class size is more likely to slow down than to speed up, in view of both the declining rate of increase in enrollments and the widespread feeling that we have reached a point where we are in danger of overly depersonalizing the educational process. A slowdown in the rate of increase in class size—let alone a decrease!—would of course imply even larger increases in cost per student than are projected here.

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[26] To treat increases in class size as causing proportionate increases in output per man-hour is to assume that the student in the large class learns as much—and thus represents as much educational "output"—as he would have had he been in a smaller class. This is hardly the place to become embroiled in the old controversy over the relationship between class size and educational quality. But without pretending to know precisely what this relationship looks like, it still seems reasonable to assert that, beyond some point, increasing class size will tend, other things equal, to be associated with some decrease in the quality of the educational product. To this (unspecified) extent, measuring increases in "output" simply in terms of the number of students who attend so many hours of classes, without making any adjustment for the quality of the hour's experience, exaggerates the extent of whatever true increases in output per man-hour may have come about as a result of larger class size. However, when we are interested primarily in projecting total costs, this distinction is not of paramount importance, since increasing class size has the same implications for expenditures whatever the effects on the quality of education.

On the other side of the ledger is the possibility of major breakthroughs in the technology of education which would result in sharp gains in productivity. Considerable attention is being given to the development of teaching aids of various kinds, and everyone concerned about education can only hope that ways will be found to teach more effectively at lower cost. However, in speculating about the significance of these developments for cost per student in the decade ahead, it is well to recognize that many of the most exciting ideas are still untested, and that even if they turn out as well as is hoped, practical implementation on any large scale would require considerable lead time and administrative effort—as well as substantial capital expenditures.

An even more important question from the perspective of the institutions with which we are primarily concerned in this paper is whether electronic teaching aids are particularly well-suited to the level of education in which they specialize. It is going to be easier to develop pedagogically and economically viable ways of presenting basic subject matter to large groups of students than to find methods of teaching advanced materials which will develop simultaneously the capacities of highly selected students to make new contributions on their own. The conscientious supervision of a student's independent work is the essence of high-level graduate education, and it is an important element in the undergraduate preparation of highly qualified students. Yet it is hard to see how any significant savings in faculty time are to be achieved here.

In short, the very nature of the educational mission of the major private universities makes it unlikely that they will benefit to any great extent from whatever technological innovations do occur. The same comments can, of course, be applied to other institutions which emphasize graduate education or the small group mode of undergraduate education characteristic of many liberal arts colleges. An important exception to this generalization is that all of these institutions do stand to benefit from the prospective introduction of new technology into library operations. Even here, however, savings will be realized only after there have been considerable expenditures on experimental efforts, equipment, retraining of staff, and so on.

Looking ahead, the best hope would seem to be that teaching aids eventually will reduce the real resource costs of providing large-scale instruction in basic subjects, and that the savings achieved in this area can somehow be used to strengthen the financial capacity of the entire system of higher education to provide the intensive, the individualized instruction which will continue to be required. In thinking about the financial circumstances of the major private universities, however, it seems unrealistic at this juncture to expect technological innovations to offset significantly the upward pressure on costs. More generally, it is of course possible that efforts now under way to increase the efficiency with which universities use the resources at their disposal will result in some immediate savings. There is certainly everything to be said for taking a hard look at existing practices and trying to find better ways of managing all aspects of University operations. It should be understood, however, that the benefits to be obtained from any "rationalization" program are apt to take the form of an immediate reduction in costs in the base year (a once-and-for-all shift in the cost function); it is much less likely that efforts of this kind, no matter how vigorously pursued, will offset to any appreciable extent the underlying pressures described above for *cumulative* increases in cost per student over long periods of time. In short, this writer concludes that current cost per student ought to be expected to continue to increase at a rate of something like 7½ percent per year if these institutions are to meet their responsibilities.

Let us turn now to the second step involved in projecting total expenditures—projecting enrollments. Between 1956 and 1966, enrollment at our three case-study institutions increased 42 percent, on the average. If one were to look only at nationwide trends in the size of the relevant age group and in the proportion of the age group attending institutions of higher education, he might expect a considerably smaller rate of increase over the next ten years.[27] However, enrollment at the major private universities is less sensitive to demographic trends (in both the upward and downward directions) than is enrollment generally, and it seems unlikely that the controlled growth of these institutions will be slowed appreciably by the projected decline in the rate of increase of the total student population. This conjecture is reinforced by the nationwide tendency for graduate enrollment to grow more rapidly than undergraduate enrollment.[28]

In view of these considerations, it seems reasonable to assume that enrollment at the typical major private university should increase roughly 40 percent between 1966 and 1976 (which works out to an average increase of 3.4 percent per annum). This projected rate of increase is consistent with the recent experience of our three case-study institutions, with the recent experience of all private universities, and with the Office of Education projections for all private four-year institutions.[29] Still, this number is more or less pulled out of the air, and it must be used with appropriate caution.

To convert these projected rates of increase in cost per student and in enrollment into a projection of dollar expenditures at a "typical" major private university in 1975–76, we now need base-year (1965–66) figures. The base-year estimate of cost per student needed for this purpose should include all applicable indirect costs, as well as the direct costs of instruction and departmental research. On the basis of admittedly rough calculations, we obtain an average of about $3,500 per student at Chicago-Princeton-Vanderbilt in 1965–66,[30] and this is the base-year estimate of expenditure per student incorporated in the projection presented below. We use 7,000 as our base-year enrollment estimate. This seems a somewhat more representative figure than the average enrollment at Chicago-Princeton-Vanderbilt, which was 5,860 in 1965–66.

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[27] The Office of Education has estimated that if current trends continue, total degree credit enrollment in all institutions of higher education will increase by 63 percent between 1965 and 1975, compared with an increase of 108 percent between 1955 and 1965. (U.S. Department of Health, Education, and Welfare, Office of Education, *Projections of Educational Statistics to 1975–76*, 1966 Edition, Table 4.)

[28] The Office of Education publication cited in the previous footnote projects an increase in graduate enrollement of 87 percent between 1965 and 1975 (Table 11).

[29] As noted above, the average increase over the past ten years for our three case-study institutions was 42 percent. The comparable figure for all private universities is 35 percent. The Office of Education projection for four-year private institutions is an increase of 40 percent between 1965 and 1975.

All of these assumptions are combined in Table 3 in such a way that a reader who wishes to alter any particular assumption can recalculate the dollar projection accordingly. The table is largely self-explanatory. It is not so much the absolute dollar figures as the rates of increase which are important. What the table is meant to illustrate is the implications of recent trends for the amount of money an institution with the composite characteristics of Chicago-Princeton-Vanderbilt might expect to spend for educational and general purposes in 1975–76. The results suggest that expenditures over this 10-year period will nearly triple, with the absolute amount of money spent rising from a little less than 25 million dollars in 1965–66 to more than 70 million dollars in 1975–76.

It must be emphasized that these figures do *not* include capital expenditures or expenditures for organized research, student aid, or auxiliary activities. It should also be noted that the projection is in current dollars, and includes an implicit allowance of about 2 percent per year for increases in the general price level. Any pronounced departure from this average rate of increase in prices, in either direction, would require that this projection be modified; however, the historical record indicates that educational costs are relatively sluggish, and so something less than a proportionate adjustment would be in order.

TABLE 3.—*Projected educational and general expenditures,[1] at a "typical"[2] major private university, 1965–66 to 1975–76*

	Assumed base-year (1965–66) values	Average annual growth rate (percent)	10-year multiplicative factor	Projected 1975–76 values
1. Educational and general expenditures per student	$3,500	7.5	2.06	$7,210
2. Enrollment	7,000	3.4	1.40	9,800
3. Total educational and general expenditures (1×2)	$24,500,000	11.7	2.89	$70,658,000

[1] Includes direct cost of instruction and departmental research and applicable indirect costs: excludes all capital expenditures and current expenditures for organized research, student aid, and auxiliary activities.
[2] As indicated by average figures for Chicago-Princeton-Vanderbilt, except that the base-year enrollment figure is larger (see discussion in the text).

Among the many alternative projections which can be made, it may be of particular interest to see what the trend in cost per student implies for total expenditures *if enrollment were to remain fixed at the 1965–66 level.* Even in this case, projected expenditures in 1975–76 would be about 50 million dollars—an increase of more than 25 million dollars over the 1965–66 level.[31]

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[30] This is a combined average for undergraduate and graduate programs. At an institution like the University of Chicago, with a very large graduate student population relative to the number of undergraduates, average cost per student should be expected to be higher for this reason alone. The mix of students among fields of study will of course also affect average cost per student.

These projected increases are not just large—they are staggering, by almost anyone's definition of that word. Whether our "typical" university will in fact spend this much money for educational and general purposes in 1975–76 depends, of course, not just (or even mainly) on the soundness of the analysis underlying these projections, but also on what happens to sources of income. Only if income increases at a corresponding rate can these increases in expenditures occur, and it is to the outlook on the income side of the ledger that we now turn.

THE OUTLOOK FOR INCOME COMPARED WITH THE TREND IN EXPENDITURES

The Major Sources of Income and Their Relative Importance

The changing relative importance of the principal sources of income at Chicago-Princeton-Vanderbilt and at all private universities is shown in Table 4. These figures are meant to provide an overall perspective which will be helpful in considering the outlook for each of the main sources of income.

By far the most dramatic change is, of course, the sharp increase in the relative importance of government contracts and grants. The item which has declined in relative importance most significantly over the years is endowment income—having accounted for nearly half of all current expenditures at Chicago-Princeton-Vanderbilt in the years prior to World War II and for only a little over one-tenth of total expenditures in 1965–66. Changes in the relative importance of the various "traditional" sources of income can be seen more easily when government grants and contracts are excluded, as they have been in the bottom panel of the table. Again, the relative decline in endowment income is apparent. And, as universities have come to rely less heavily on endowment income, they have come to rely more heavily on current gifts.

The increased importance of annual fund-raising, and the task of the securing and administering of government project funds, have added significantly to the workload of faculty members and administrative personnel at all universities. A more fundamental implication of these developments is that the major private universities are now living more dangerously than ever before. The declining relative importance of "hard" sources of income in turn affects both the ability of the universities to plan and their willingness to make long-run commitments, especially in new fields. This problem, which results from the *composition* of university income as distinct from the level, must be borne in mind when considering alternative methods of providing additional funds.

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[31] Actually, this projection is probably too low, for reasons noted earlier. If enrollment is stable, average cost per student may well rise more rapidly than the historical rate of 7½ percent per year. The historical rate was calculated on the basis of experience in a period of rising enrollments, and if university education is subject to any economies of scale at all, the rate of increase in average cost per student used as the basis for these projections would have been somewhat larger had enrollment been stable. Of course, in any actual situation, the effect of rising enrollment on cost per student will depend heavily on such particularistic considerations as the fields in which expansion occurs, the initial numbers of staff and student body in that field, and so on.

TABLE 4.—*Sources of current income,*[1] *selected years—(percentage distribution)*

	Chicago-Princeton-Vanderbilt (average) [2]					All private universities	
	1965–66	1955–56	1948–49	1939–40	1924–25	1963–64	1955–56
A. Educational and general income from all sources:							
1. Government grants and contracts	45.9	24.4	13.0	1.4	----------	45.1	27.2
2. Student fees	22.7	26.8	39.9	35.8	50.6	34.4	43.9
3. Endowment income	13.4	23.3	29.2	46.8	43.5	8.8	13.2
4. Private gifts and grants	12.5	20.3	16.0	13.0	2.2	11.8	15.8
5. Other	5.5	5.2	2.0	3.1	3.8	----------	----------
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
B. Educational and general income excluding Government grants and contracts:							
1. Student fees	41.5	35.5	45.6	36.4	50.6	62.6	60.2
2. Endowment income	25.1	30.4	33.1	47.3	43.5	15.9	18.1
3. Private gifts and grants	23.3	26.9	19.1	13.2	2.2	21.4	21.7
4. Other	10.1	7.1	2.3	3.1	3.8	----------	----------
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Excludes income used for capital expenditures, and income derived from the operation of hospitals and auxiliary enterprises.

[2] Includes only Princeton and Vanderbilt in 1924–25 and 1939–40.

NOTE.—Detail may not add to total because of rounding.

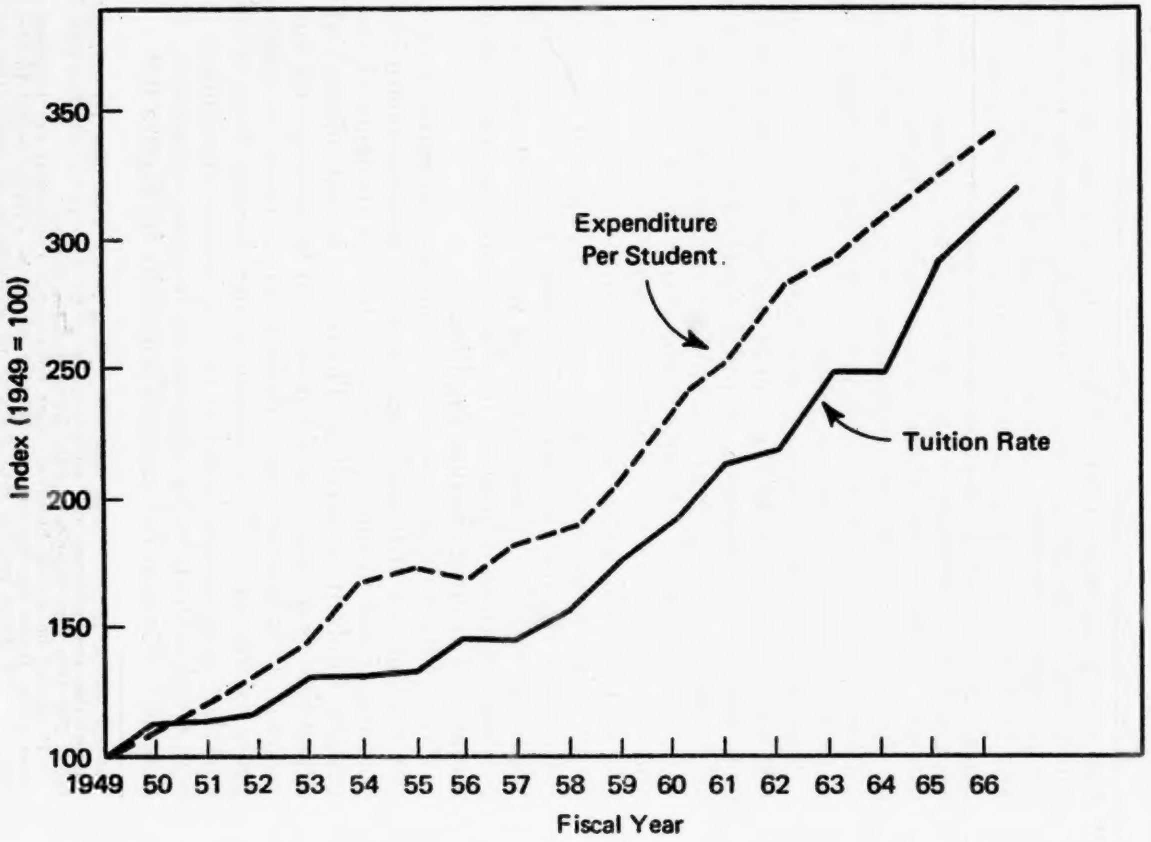
INCOME FROM TUITION AND FEES

Historically, one of the principal ways in which private universities have met rising costs has been by increasing student fees. The relative rates of increase over the post war period in tuition and in direct educational cost per student at our three case-study institutions are depicted in Figure 5. The average tuition rate at Chicago-Princeton-Vanderbilt has tripled over this period, but still has not kept pace with the cost index. Closer inspection of the figure reveals, however, that it was mainly during the early postwar years that increases in cost per student outstripped increases in tuition. Since about 1958, tuition has actually gone up slightly faster than the index of educational costs (a little over 8 percent per annum on the average, compared with an average annual rate of 7½ percent for the cost index). As all prospective students and their parents are well aware, this means that university tuition has risen *much* faster than the prices of most other things.

Will tuition continue to increase at this rate? The answer depends in part—and probably in large part—on the future of student aid programs. But, for the moment, let us ignore this issue by assuming that student aid programs continue to evolve more or less as they have in the last decade. It will now be argued that, while there is every reason to think that tuition will continue to rise, it seems doubtful that the rate of increase will be as rapid as it has been at Chicago-Princeton-Vanderbilt over the last 10 years.

Figure 5

Relative Increases in Direct Educational Expenditures Per Student and in Tuition Rates, Chicago-Princeton-Vanderbilt, 1949-1966



For one thing, two of these three institutions had tuition rates in 1958 which were very low indeed, compared with the rates charged by comparable universities. Therefore, part of the sharp upward climb of the average tuition index should be interpreted as representing a kind of once-and-for-all catching up by these institutions with rates charged at other universities. Some crude calculations suggest that correcting for this "catch-up" factor reduces the average rate of increase in tuition from a little over 8 percent per annum to 5 or 6 percent.

A second, more substantive, reason for expecting some slowdown in the rate of increase in tuition has to do with the desires of the private universities to attract students from all socio-economic levels. Many of the private universities have made major efforts in the years following World War II to "democratize" their student bodies, and a continuing rapid increase in tuition rates, unless accompanied by greatly increased expenditures for student aid, is bound to hamper these efforts. For those who believe that places in the major private universities should go to the best-qualified applicants, regardless of financial circumstances, the prospect of increases in tuition averaging more than 8 percent a year is disturbing indeed.

Such a prospect is particularly distressing when viewed in the context of tuition levels at the public institutions. Student charges (tuition, fees, room and board) at public institutions have not risen nearly as rapidly in recent years as student charges at private institutions. Whereas the ratio of charges at the two types of institutions moved up and down within a fairly narrow range between 1928 and 1956 (from 1.52 to 1.65), this ratio has moved steadily upward in the last decade. In 1966, it cost more than *twice* as much to attend the average private institution than to attend the average public institution.[33] Further widening of this differential could well make it very difficult for the private institutions to enroll increasing numbers of students from middle, as well as lower, income families.

Even if the tuition rate were to increase as rapidly as expenditures per student, we still could not expect a proportionate increase in the amount of *net* income contributed by the students *themselves* to the general funds of universities. The reason is that substantial increases in expenditures on student aid must also be anticipated and taken into account. It is instructive to deduct expenditures on student aid from gross fee income (defined simply as total income from tuition and fees) and then calculate an index of net fee income per student which can be compared with an index of gross fee income per student. This has been done for Chicago-Princeton-Vanderbilt in Figure 6.[34]

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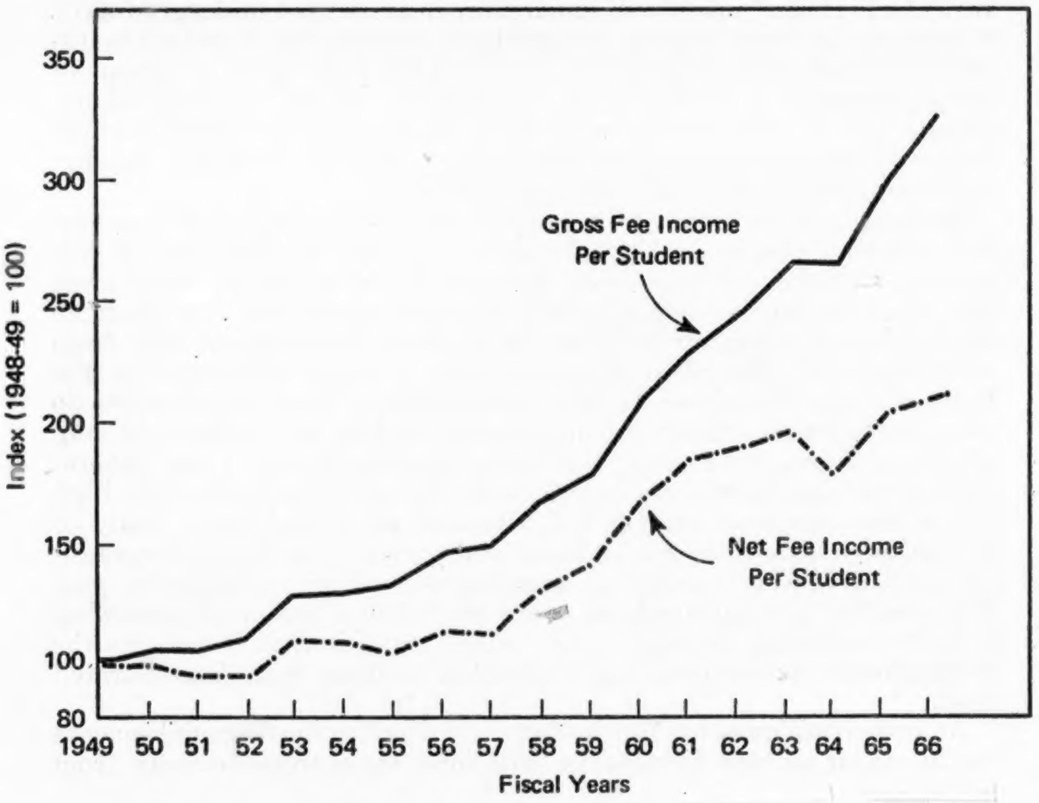
[33] The actual ratio in 1966 was 2.07. These ratios are based on a sample of 32 public universities and colleges and on a sample of 28 private universities and 71 private colleges. The data were supplied by the Bureau of the Budget.

[34] It should be noted, however, that figures for Vanderbilt are included only for years since 1960. Gross fee income per student would be exactly equal to the tuition rate if there were a single tuition rate charged all students in an institution and if there were no fees. The (minor) differences between the index of gross fee income shown on this figure and the index of tuition rates shown in Figure 5 are due mainly to the absence of Vanderbilt from the figures on Figure 6 for earlier years, not to the differences between the concepts.

This figure shows dramatically how the gap between gross fee income per student and net fee income per student has widened, especially since 1962. Thus, figures showing increases in tuition rates (or in gross fee income) overstate considerably the *net* amount of the additional funds which have been supplied to institutions by students themselves. The implication is that the changes in the relative importance of broad categories of income shown in Table 4 exaggerate the share of income now being provided by the student himself and understate, to a corresponding degree, the increased relative contribution of the sources (mainly the Federal Government and foundations) which have made possible the greatly increased expenditures on student aid.

Figure 6

Gross Fee Income and Net Fee Income Per Student,
Chicago - Princeton - Vanderbilt
1949-1966



The following numbers, based on some extremely crude calculations,[35] illustrate the dollar changes in educational expenditures per student, gross fee income per student, and net fee income per student:

	1962	1966	Amount of change
Estimated current educational expenditures per student	$2,880	$3,550	+$620
Gross fee income per student	1,186	1,590	+404
Net fee income per student	824	911	+87

While expenditures per student have increased about $620, and while gross fee income per student has increased more than $400, net fee income per student has increased less than $100! What has happened is that increased expenditures on student aid have largely offset increases in gross fee income.

The extraordinary increases in expenditures on student aid which have occurred in recent years (more than doubling between 1962 and 1966 at our case-study institutions) are the result of three reinforcing tendencies. First, the number of graduate students has increased relative to the number of undegraduates—and this change in student mix affects expenditures on student aid because graduate students are (and always have been) subsidized much more heavily than undergraduates. Second, the average stipend per graduate student has increased markedly in recent years, largely as a result of the fellowship programs of the government and of private foundations. Third, as noted above, private universities have been making an increasing vigorous effort to enroll more students from low-income families, and this too has meant an increase in student aid appropriations.

From what sources have the greatly increased expenditures on student aid been obtained? Unfortunately, we have no firm data on this subject, even for our case-study institutions. However, it seems clear that the new funds made available for this purpose at the graduate level have come primarily from the Federal Government and from other national fellowship programs such as those sponsored by the Danforth and Woodrow Wilson Foundations. Some universities do have considerable endowment income earmarked for student aid and, at the undergraduate level, additional appropriations from general funds have also fed the student aid pool. By combining relatively high tuition and generous student aid, allocated on a need basis, many of the major private universities have been pursuing, at the undergraduate level, a de facto policy of charging according to ability to pay. The case for this approach, as contrasted with a policy of providing a uniform subsidy through a low tuition rate, is that it permits the institution to concentrate larger subsidies on those with demonstrated need.

An important question for the future is whether the financial squeeze on the major private universities will force them to move away from a policy of charging according to ability to pay. This question is in fact most likely to be determined by decisions reached at the state and national levels concerning student aid programs. In any case, it is clear that the ability of the universities to provide increased financial aid to students at both undergraduate and graduate levels will in turn affect the rate at which tuition can be increased.

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[35] First, we took the estimate of current educational expenditures per student (including indirect costs) for 1966 of $3,500, used previously (see p. 31), and estimated the comparable figure in 1962 on the basis of the index for direct expenditures per student. This assumes that the ratio of direct costs to indirect costs has not changed over this period. We then calculated average gross fee income and average net fee income at the three institutions in 1962 and 1966.

INCOME FROM ENDOWMENT

Endowment income at all private universities increased at an average annual rate of 6.8 percent per year between 1952 and 1964; at our three case-study institutions, the average rate of increase was 7.7 percent per year between 1956 and 1966 and 7.2 percent over the 18-year period from 1948 through 1966.

The outlook for endowment income is dependent on two considerations: (1) the amount of new endowment secured by the universities; (2) the rate of return which is earned on the investment portfolios of the universities.

McGeorge Bundy of the Ford Foundation has questioned the effectiveness of university investment policies, and he may well be right in suggesting that greater willingness to take risks would result in higher income from endowment. Until a careful study is made of this aspect of university finances, however, we have no basis for estimating the amount of the gains to be realized from better investment policies. But, not even those people most strongly convinced that investment policies can be improved significantly have argued that such actions will take us more than a small part of the way toward a solution of the overall financial problems of the universities.*

In the short run, the financial squeeze on major private universities may be eased somewhat by spending a portion of capital gains which in earlier years would have been reinvested. However, it should be clear that this is no solution to the longrun problem—indeed, unless decisions to spend capital gains are accompanied by equivalent improvements in the overall return on endowment (which seems highly unlikely), spending capital gains will of course reduce endowment income at some future time.

Whatever the outcome of studies of investment policies, it is clear that the longrun rate of growth of endowment income will continue to depend heavily on the ability of the universities to obtain additional principal. In this respect, the outlook for endowment income is effected by most of the same considerations which apply to all forms of giving.

PRIVATE GIFTS AND GRANTS

It is doubtful if any observer of university finances in the mid-1940's could have predicted the extraordinary increase in private contributions which was to occur in the postwar period. The best source of information on long-term trends in giving from all private sources (individuals, corporations, and foundations) is the annual publication by John Price Jones Company, Inc., which has published figures for 42 colleges and universities going back to 1920–21.[36] Figure 7 shows the total amount of gifts and bequests received by a consistent set of 19 of the larger private colleges and universities included in this survey during each fiscal year from 1952 through 1966, and an approximate total for 1945 as well.[37]

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*See the paper by James H. Stauss in this volume for a further discussion of this issue.

Also shown on this graph are the gifts and bequests received by the 40 major universities included in each of the six biennial surveys conducted by the Council for Financial Aid to Education over the period 1954–55 through 1964–65. It should be noted that all of these totals include restricted and unrestricted grants, and funds used to construct buildings and facilities as well as to defray current costs.

Gifts received by the 19 private schools included in the John-Price-Jones survey increased from an annual total of about 50 million dollars in the mid-1950's to over 300 million in each of the last two fiscal years. The figures collected by the Council for Financial Aid to Education for 40 private universities show an even greater increase in gifts between 1955 and 1957, and a very similar pattern thereafter.

This extraordinary growth in private giving has very little of the regularity characteristic of the expenditure figures plotted earlier, however. One important feature of the historical record to be noted is that almost all of the great upsurge in giving has occurred since the middle of the 1950's. If the average figures for our 19 private colleges and universities in the 1930's and the 1920's had been plotted, the plateau-like character of the curve in the earlier years would be even more evident.[38]

The "take-off" of giving around 1955 can be attributed in good measure to the dramatic Ford Foundation program of faculty salary endowment grants,[39] to the activities of the Council for Financial Aid to Education, and to the growing general awareness of both the importance and the needs of higher education. The erratic year-to-year behavior of the figures in the period since 1957 is due to the timing of foundation programs, large bequests, and major fund-raising campaigns. Thus, the peak reached in 1965, followed by the decline in 1966, is related to the fact that the final stages of a number of important fund-raising campaigns happened to coincide in 1965.

These sharp year-to-year fluctuations in gifts and grants mean that calculating average annual growth rates between terminal years could give a highly misleading impression. Under the circumstances, it is

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[36] The main reason for shifting, at this point in the analysis, from data for our three case-study institutions to data for a larger set of universities is that the gifts received by any particular instituion in any paricular year may be influenced heavily by he timing of a capital campaign or by the receipt of one or more unusually large bequests. As is pointed out below, these same factors even impart an irregular pattern to the figures on total gifts received by a relatively large number of institutions. The variability of these aggregate figures is, however, much less pronounced than the variability of the figures for a set of three institutions, and for this reason the aggregate data provide a better basis for estimating trends.

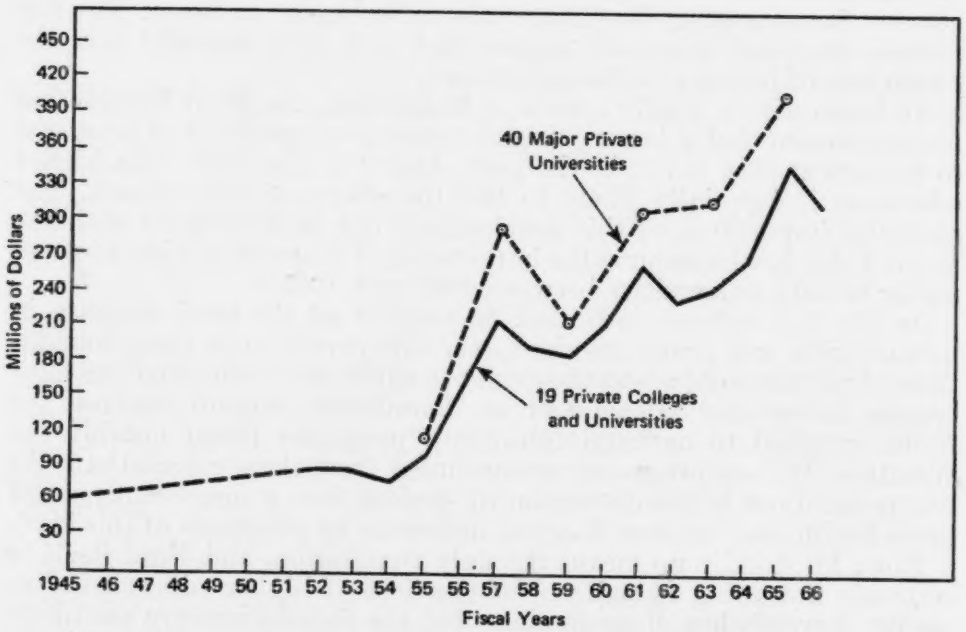
[37] The report for 1965–66, from which these figures were taken, presents only ten-year averages for the decades 1921–30, 1931–40, and 1941–50. The figure shown on our graph for 1945 is a rough estimate obtained by adjusting the yearly average for the period 1941–50 ($45.4 million) upward to $55 million to reflect the assumption that a disproportionate share of all gifts made during this decade came in the latter half of the period.

[38] The yearly average for the 1930's was 33.2 million, and the corresponding figure for the 1920's was 44.5 million. As was noted above, the actual yearly average for the period 1941–1950 was 45.4 million.

[39] Totaling approximately 200 million dollars. Institutions other than those represented in Figure 6 of course received some of this money. Foundations in general provided nearly half (46.7%) of all gifts received in 1956–57 by the 464 institutions comprising the core group included in Council for Financial Aid to Education surveys.

Figure 7

Private Gifts and Grants to Nineteen of the Larger Private Colleges and Universities, 1945-1966, and to Forty Major Private Universities, 1955-1965



worth resorting to a slightly more complex procedure for estimating average annual growth rates. First, we restrict the period covered to 1956–1966, thus excluding the earlier plateau-like period and part of the once-and-for-all jump to the new level of giving. Second, we fit a regression line to the 11 remaining annual observations obtained from the John-Price-Jones survey.[40] The result is an average annual growth rate over this period of 6.4 percent.[41]

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[40] We use the John-Price-Jones data rather than the CFAE data because there are more observations, including an observation for the most recent year, fiscal 1966. Strictly speaking, we fit a least-squares regression line to the *logarithms* of the annual observations, since this gives a better approximation than a line fit to the regular figures.

[41] It should be pointed out that this result differs markedly from results obtained by John Pollard of the Council for Financial Aid to Education ("Voluntary Support of American Higher Education: A Space Program for the Future," paper given at a conference of development officers arranged by the American Alumni Council at Los Angeles, March 31, 1967). By calculating average annual growth rates for each source of given between 1954–55 (the year of the first CFAE survey) and 1964–65 (the most recent survey year), and then averaging these growth rates using the relative importance of each source in 1964–65 as weights, Pollard arrives at an implicit overall rate of growth of *14.6* percent per year. (In arriving at this [implicit] overall growth rate, Pollard did modify the general procedure described above by reducing the rate of increase of foundation giving by one-third to reflect his assumption that the annual growth rate of this source will fall back a bit.) The main reason he gets such a much higher growth rate than we do is that he uses the terminal-year method of calculation. As can be seen from Figure 6, the 1955 starting point happened to be a year when giving was very low (the last year before the big upsurge in giving) and the end point happens to be a year when giving was extremely high (1965). If Pollard had taken a later base year, and if he had been able to take account of the *drop* in giving which the John-Price-Jones data show occurred in 1966, he would have obtained a growth rate much closer to the figure we obtained. (Pollard's rate would still have been slightly higher than ours, presumably because his sample includes more institutions who have begun serious found-raising efforts more recently, and thus have made relatively large gains; but this difference would be relatively minor.)

The key question, of course, is what rate of increase in giving is likely to prevail in the future. Ideally, this question should be approached by analyzing in detail the outlook for each of the main components of private giving. Unfortunately, time limitations ruled out this way of approaching the problem, so a more impressionistic approach was taken. We made our best estimate of the average annual rate of growth in recent years (6.5 percent per year) and considered reasons for expecting the future rate to be higher or lower. The five factors discussed below all suggest that it is very doubtful that the recent rate of increase can be maintained.

To begin with a highly specific consideration, the Ford Foundation has announced that it is not going to continue to spend out of principal to the extent that it has in the past. And it is also clear that higher education is especially likely to feel the effects of the cutback. The potential importance of this development can be illustrated with the aid of Table 5, which shows the importance of foundation gifts to seven major private universities between 1962 and 1966.

As the last column indicates, 36 percent of the total increase in private gifts and grants received over this period came from foundations. And this *understates* the extent to which university finances have become increasingly dependent on foundation support because the funds supplied to national fellowship programs (most notably the Woodrow Wilson program) are excluded from these calculations. As was pointed out in the discussion of student fees, a significant part of gross fee income has been financed indirectly by programs of this kind.

Now, Ford is by no means the only foundation, and Ford itself is certainly not going to pull out of the field of higher education altogether. Nevertheless, it seems clear that the foundations are not likely to continue to *increase* their grants to the major private universities at anything like the pace they have set in the last ten years. Indeed, over the short-run, foundation grants may well decline in absolute amount, as they did between 1965 and 1966; but even if the present high level of foundation giving is maintained or, for that matter, increased slightly, the burden on other sources of support will still be increased markedly. Built into the 6.5 percent average rate of increase (our best estimate of growth in giving) is an increase of somewhere between 10 and 15 percent a year in foundation giving.[42] And, unless some other source of support not only maintains its own past rate of increase but also picks up whatever slack does occur here, total private giving will not continue to grow at 6.5 per year.

A second reason for doubting whether past rates of growth in private giving can be maintained has to do with recent trends in individual giving for all philanthropic purposes. If one traces the history of philanthropic contributions as a percent of personal income from the

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[42] The lack of a more precise estimate is due to the fact that the John-Price-Jones data contain no breakdown by source of gifts for past years. The range of 10 to 15 percent is based on figures from the CFAE surveys for all 464 of their core institutions and on figures for years since 1962 for seven major private universities. Again, it should be noted that none of these data include grants for fellowships.

1920's to the present, he finds that over this long period there has been a fairly steady upward trend in the propensity to give. In the 1920's, estimated total contributions averaged about 1.5 percent of adjusted gross income; this ratio rose to around 1.7 percent in the 1930's, to 2.1 percent right after the war, and to slightly over 2.5 percent in 1960. However, between 1960 and 1964 (the most recent year for which data are available), the ratio has not only failed to increase—it has actually declined slightly.[43]

TABLE 5.—*Sources of private gifts and grants at 7 major private universities, 1962–66*

Sources of private gifts and grants	Amount given in base year (fiscal 1962) (millions)	Average amount given in fiscal years 1963–66	Absolute increase	Absolute increase for each source as percent of total increase
Individuals (gifts and bequests)	$90.1	$105.3	$15.2	52.2
Corporations	14.0	17.3	3.3	11.4
Foundations	53.3	63.9	10.6	36.4
Total	157.4	186.5	29.1	100

Source: Data compiled by Chicago, Columbia, Cornell, Harvard, Princeton, Stanford, Yale.

It is hard to know what explains this recent leveling off in the ratio of gifts to income. Perhaps it was the particularly favorable economic and tax environment of the last two decades which caused the previous upsurge in giving. (Individual giving in the years following World War II was facilitated by the postwar boom in the stock market and by changes in 1952 and 1954 in the income tax law, which together doubled the allowable deduction for philanthropic contributions.) Or perhaps there are deeper explanations, related to the changing role of government, to the attitudes of individuals toward their philanthropic obligations, to the changing composition of the high income groups, or to other factors which we simply do not understand. Whatever the explanation, the implication of a more or less constant ratio of contributions to income is of course that the total pool of philanthropic funds made available by individuals grows only as fast as personal income—roughly 5 percent per year.

A third factor affecting the amount of money the major private universities can expect to receive from all private sources—foundations, corporations, and individuals—is the extent of the competition for these funds. This writer is in no position to offer even reasonable conjectures concerning the future fund-raising ability of such groups as religious organizations and community chests. However, it is possible to identify at least two groups who are likely to do an increasingly successful job of competing with the private universities for funds: performing arts organizations and state-supported universities. This is not the place to review the reasons for expecting the performing art—and other cultural activities—to make an increasingly effective case for the philanthropic dollar, but a word about the state universities is in order.

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[43] See *Performing Arts: The Economic Dilemma*, pp. 309–312 and Appendix Table XIII-A for data through 1962. (This study also contains general discussions of the outlook for contributions from corporations and foundations as well as individuals.) Information for 1964 has just been made available, and while time has not permitted us to make the rather involved calculations necessary to obtain a ratio comparable with the ratios given in the text, it is clear that the ratio for 1964 will be slightly lower than the ratio for 1962, which in turn was slightly lower than the ratio for 1960. The percent of all taxpayers who submitted itemized returns was almost exactly the same in 1962 and 1964, and so it is possible to obtain a good picture of the change in individual giving over this period by comparing the ratio of itemized contributions to adjusted gross income of persons submitting itemized returns in the two years. In 1962 this ratio was 3.64 percent, and in 1964 it was 3.41 percent. Actually, the trend in itemized contributions is, if anything, more relevant for higher education than the trend in total contributions, since higher education receives such a large proportion of its gifts from the high-income taxpayers, who almost all elect to submit itemized returns.

A major study of giving to all institutions of higher education in 1962–63, to be published by the American Council on Education, found that state-supported public institutions received over 150 million dollars in gifts in that year alone.[44] The John-Price-Jones survey for 1965–66 noted that while giving to the 42 private institutions included in its sample was lower than in the previous year, giving to the eight public universities included in its sample increased by more than 12 million dollars. In short, the day is past when private giving to higher education and private giving to private institutions of higher education were largely synonymous. This development is clearly healthy development, from the standpoint of our entire system of higher education as well as from the standpoint of the state institutions themselves, but it does mean that the private institutions may have a harder time securing the increased contributions which they require.

The fourth reason for thinking that there will be some tapering off in the rate at which giving to private universities increases involves an application of the principle of diminishing returns to fund-raising activities. It has been during the postwar period that universities have really built up their fund-raising organizations, and some part of the sharp increase in contributions during this period is no doubt due to the extremely limited character of earlier fund-raising efforts. By now, however, all of the major universities have been actively engaged in systematic fund-raising campaigns for some time, and it may well become more and more difficult to match the rates of increase in contributions achieved in the past.

Finally, there is the changing composition of the student body at the major private universities to be considered. At these institutions, alumni are by far the most important source of private support, both directly through their own giving (accomplished sometimes via family foundations) and indirectly through their influence on corporate giving. As was pointed out in the discussion of tuition charges, there has been a marked change in the family backgrounds of the typical students attending many of the major private universities. A smaller and smaller fraction of the undergraduates come from families of great wealth. And a higher and higher proportion of the total student body is made up of graduate students, who not only are much less likely to have come from wealthy families than the undergraduates of the prewar days, but who also have already formed a loyalty to their own undergraduate institution.

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[44] Calculated from Table VI–B of the manuscript. This study has been directed by Professor Julian Levi of the University of Chicago, and promises to be an important source of detailed information concerning all aspects of giving to higher education

Furthermore, increasing numbers of students at the major private universities are pursuing careers not likely to result in the accumulation of great wealth. At the same time, the proportion of top business executives who attended the major private universities is decreasing simply because these institutions are educating a much smaller share of all college graduates than in earlier periods.

For all of these reasons, the alumni of the major private universities in the years ahead should be expected to be less attractive targets for the fund-raiser than the present alumni group. However much one may applaud the changing characteristics of the student bodies of private universities it is still necessary to recognize the financial implications of this change. Over the long-run, this change may well be the most important factor tending to reduce the rate of growth of giving to the major universities.

The five considerations discussed above all suggest that giving to the major private universities in the future is likely to grow less rapidly than the rate of 6.5 percent per year which summarizes what has been happening during the last 10 years. But *how much* less rapidly? No quantitative estimates can flow from the kinds of general propositions presented above without a great deal more research—and even then a large dose of judgment would still be required. For the present, a rough guess will have to suffice. A rate of increase ranging from 4 to 5½ percent per year is used in the projections developed in the next section; but as in the case of our expenditure projections, the numbers are presented in such a way that a reader who can use other estimates and readily modify the projections.

PROJECTING INCOME

Projecting university income is an extremely hazardous undertaking. Whereas the fundamental forces pushing up costs operate in a fairly regular, predictable fashion, the factors affecting some of the major components of income are much more apt to change in unforeseen ways. In partial recognition of these uncertainties, a "higher" and a "lower" projection of educational and general income at our "typical" major private university are presented in Table 6. Needless to say, this procedure serves as no guarantee that the "right" projection lies between these two sets of estimates.

This table is constructed in the same manner as the table containing the projections of educational and general expenditures. The key assumptions are reflected in the average annual growth rates. Since the basis for each of these assumptions has already been discussed, all that is needed here are a few words by way of summary

TABLE 6.—*Current and projected educational and general income*[1] *at a "typical" major private university, 1965–66 to 1975–76*

[Dollars in millions]

	Base year (1965–66) values [2]	Average annual growth rate (percent)	10-year multiplicative factor	Projected 1975–76 values
A. Higher projection:				
1. Gross fee income	$11.3	[3] 9.6	2.50	$28.3
2. Endowment income	6.8	5.0	1.63	11.1
3. Gifts and grants	6.4	6.0	1.79	11.5
Total	24.5	7.6	2.08	50.9
B. Lower projection:				
1. Gross fee income	11.3	[4] 7.5	2.05	23.4
2. Endowment income	6.8	3.5	1.41	9.6
3. Gifts and grants	6.4	4.5	1.55	9.9
Total	24.5	5.8	1.75	42.9

[1] Excludes income used for capital expenditures, for organized research, for student aid, and for auxiliary activities.

[2] We assume that the institution in question has a balanced budget in the base year. Thus we set total educational and general income in the base year equal to the figure for total educational and general expenditures given in table 3 ($24.5 million). The distribution of total base-year income among the fee income, endowment income, and gifts and grants categories was made on the basis of the actual percentage distribution in 1956–66 at Chicago-Princeton-Vanderbilt as shown in table 4. However, in order to simplify the analysis we eliminated the "other income" category by prorating the share of income in this miscellaneous category back among the three main categories in terms of their relative size.

[3] Based on the assumptions that tuition rates increase 6.0 percent per year and that enrollment increases 3.4 percent per year.

[4] Baseed on the assumptions that tuition rates increase 4.0 percent per year and that enrollment increases 3.4 percent per year.

The projected rates of increase in gross fee income are based on (1) the same enrollment assumption underlying the expenditure projection—namely, an average annual increase of 3.4 percent per year; and (2) the assumption that increases in tuition rates will average somewhere between 4 and 6 percent per year. Tuition increased more rapidly than this between 1956 and 1966, but as was explained earlier, the previous growth rate must be interpreted in the light of the relatively low tuition charged by some universities in 1956. Furthermore, some slowing down of tuition increases is suggested by the growing differential in student charges at private and public institutions, coupled with the desire of the private institutions to attract students from all income levels.

For reasons explained in detail earlier, the increases in the amount of gross fee income shown on the table are greatly in excess of the amounts of *net* fee income which all students combined can be expected to contribute. Expenditures on student aid will have to increase much more rapidly than gross fee income, given the increasing emphasis on graduate education at the major private universities. Unless there is some unforeseen change in attitudes or policies governing student aid, net fee income should be expected to increase no more than 6 to 8 million dollars between 1966 and 1976. Thus, implicit in our projection of an increase in gross fee income of between 12 and 17 million dollars is the assumption that at least 6 to 9 million dollars of additional student aid funds will be obtained from the government, from foundations, and from other private sources. In the preparation of this paper, not enough attention has been given to the evolution of present student aid programs to permit an informed judgment of the likelihood of such increases in the absence of new (or significantly modified) programs. This issue is but one of many concerning university finances which deserve much more careful study.

The projected rates of increase in endowment income and in income from gifts and grants are based on the analysis of the record of private giving for all purposes achieved over the last decade combined with the five reasons advanced for doubting that the past rate of growth will be maintained. The overall projection is that private giving for all purposes will increase from present levels at an average rate of 4 to 5½ percent per year. (This estimate allows for the very real possibility that gifts and grants to private universities may increase hardly at all—or even decline—in the next few years, in the wake of the anticipated cut-back in the activities of the Ford Foundation, and then increase at a rate of, say, 7–9 percent per annum for the rest of the period.)

To obtain the specific rates of growth used in the table for endowment income (3 ½ to 5 percent per year) and for current income from gifts and grants (4 ½ to 6 percent per year), we assumed that the proportions of gifts and grants used for capital expenditures and added to endowment will be approximately the same as in the past. The slower rate of increase in endowment income, compared with gifts and grants to be used for current purposes, is based on the experience of private universities in general over the last decade. It appears as if the experience of our three case-study institutions, where endowment income rose at about the same rate as current gifts, is somewhat atypical in this respect.

When combined, these assumptions imply that educational and general income received by this mythical institution from all of these sources (including present government programs of students aid reflected in gross fee income) will increase from just under $25 million in 1965–66 to between $43 and $51 million in 1975–76—an implicit rate of growth of 5.8 to 7.6 percent per year.

THE INCOME AND EXPENDITURE PROJECTIONS COMBINED

In Table 7 we bring together the income and expenditure projections. The result is a projected deficit of somewhere between 20 and 28 million dollars in 1975–76. In percentage terms, between 28 and 39 percent of educational and general expenditures would *not* be covered by the traditional sources of income. How are these extraordinary numbers to be interpreted?

Certainly not as precise, carefully-derived estimates of the magnitude of potential deficits. It must be emphasized that these projections were made on the basis of limited data, crude methods of extrapolation (including a liberal dose of judgment in certain instances), and a number of heroic assumptions. In addition, such significant aspects of university finance as capital expenditures, organized research, the operation of hospitals, and the management of all kinds of auxiliary activities have been ignored. Thus, the actual numbers presented in Table 7 are subject to a large, if unknown, margin of error.

TABLE 7.—*Projected expenditures and projected income at a "typical" major private university, 1975–76*

[Dollars in millions]

	Using higher income projection	Using lower income projection
Educational and general expenditures	$70.7	$70.7
Educational and general income	50.9	42.9
Deficit	19.8	27.8

Source: Tables 3 and 6.

The substantial excess of projected expenditures over projected income is probably best viewed in more qualitative terms. The basic inference to be drawn in simply that, in the absence of significant new developments, the economic squeeze already being felt by the major private universities is going to intensify greatly. The expenditure side of the budget will be under presesure in the future from the same factors which have led to such sharp increases in university budgets in the recent past—the need to move into new, specialized, and highly-costly areas of teaching and research; the desirability of at least a modest rate of expansion in total enrollment, accompanied by a continuing increase in the ratio of Ph.D. candidates to undergraduates; and the inexorable upward push on cost per unit of educational "output" resulting from the limited opportunities for labor-saving innovations. On the income side, however, there are a number of reasons for doubting that it will be possible to maintain the extraordinarily rapid rates of increase in tuition and in private giving which have made it possible for the major private universities to cope with these pressures over most of the period since the end of World War II. It is putting these two sets of considerations together which leads to the conclusion that an exceedingly tight economic squeeze must be anticipated.

There is, however, one serious danger in stating the conclusions of this analysis in qualitative rather than quantitative terms. The danger is that we may think (subconsciously perhaps) that the "real" gap between necessary expenditures and income is somehow bound to be smaller than the projections imply. The fact of the matter is that imperfections in the methods used to derive these projections, and factors not taken into account, could affect the calculations in *either* direction. And those of us who are born optimists would do well to remember that most previous projections of this kind have underestimated the future requirements of educational institutions.

Needless to say, deficits of the size projected in Table 7 will not in fact occur. No board of trustees would tolerate an operating deficit of anything like this magnitude. If no new sources of income were to be found, what would surely happen is that increases in expenditures would be curtailed to whatever extent necessary to produce at least an approximately balanced budget. Thus, the question at issue is not whether the projections in Table 7 will or will not come true: clearly they will not. The issue is to what extent the gap depicted there will be filled largely by further increases in income (either from traditional sources or from new sources) as contrasted with a forced curtailment of expenditures.

A significant curtailment of expenditures would mean the advent of a process of retrenchment which, at the minimum, would reduce drastically the effectiveness of these universities. To appreciate the significance of even a modest slowing down in the rate of increase in expenditures, it is necessary to recognize that a high proportion of the income of almost any institution of higher education goes to meet the (rising) costs of more or less fixed commitments—the maintenance of existing plant, the payment of salaries to tenured faculty members, and the costs of essential administrative services. It is the margin between "fixed" expenditures of these kinds and income which permits an institution to participate in new developments. Thus, even a *much* smaller projected deficit than the one depicted in Table 7 would still mean that the institution in question would no longer be able to play an important innovative role—or, for that matter, to continue for long to maintain past standards of performance in the areas to which it was already committed.

Such would be the immediate, short-run consequences of the economic pressures underlying the projected gap between expenditures and income. Over the longer run, it takes no Cassandra to offer an even grimmer prognosis. Institutional morale is a delicate thing, and depends at least as much on the direction in which events are moving as on the state of affairs at any point in time. In the face of the kinds of decisions which would have to accompany any process of retrenchment, it would be very difficult indeed to retain key administrative and faculty personnel and to maintain general morale. Nor is it clear, thinking purely in financial terms, that the rates of increase in tuition income and in private gifts and grants incorporated in our projections could be achieved indefinitely under such circumstances. Given the mission of a major private university, "standing still" (let alone leaning backward) simply is not a viable posture, and any institution which is unable to maintain a forward momentum runs a clear risk of losing the support of faculty, prospective students, patrons, and friends—and thus exacerbating its problems.

In a sense it is ironic that the effectiveness of this country's educational system is itself one of the main factors responsible for the economy-wide growth in productivity, which in turn is a primary source of the upward pressure on educational costs. Fortunately, however, these same productivity gains help to provide the increments to the Gross National Product from which the ever-increasing needs of the educational sector can be met. The real issues are whether we can devise programs which will take account of the nature of the financial needs of the various components of our overall system of higher education while preserving the good features of that system—and whether we can gain political acceptance for such programs.

Expenditure Expectations for Private Colleges

Hans H. Jenny* and *G. Richard Wynn*

I. INTRODUCTION

The original purpose of this paper was to estimate future income requirements of a group of small, private, four-year liberal arts colleges. As we were progressing toward this goal, after investigating the income and expenditure structure of these colleges, their enrollment and per student income and cost growth, and upon looking at some of the more recently published projections into the 1970's of certain statistics of private higher education,[1] we decided to shift our emphasis somewhat.

We therefore have set ourselves the following objectives: (1) to show how future income requirement estimates behave when one varies enrollment targets and per student cost estimates; (2) to illustrate the effect upon future expenditure estimates of changes in the structure of the sample; and (3) to comment on a few reasons why we believe that conventional statistical projections of broad aggregates will understate perhaps substantially the future resources requirements of private colleges in general and of our group in particular.

The discussion which follows will be limited to the *current* or operating account. Some of the key elements of accounting are explained in the appendix to this chapter. Throughout we shall be working with two types of figures: (1) *aggregate* income and expense data which make no distinction between the number of schools for which the particular type of information is available (data is missing for some schools in the early years of the period studied), thus leading to a certain distortion when projected forward; (2) *per student* income and expense data which should help us minimize such distortions, particularly when used in estimating future requirements. The per student data are rendered on a Full Time Equivalent or FTE basis. This means that part time students appear as fractional enrollment units,[2] such that FTE enrollment figures may differ from published enrollment data which normally refer to persons enrolled. We shall use the abbreviation FTES to denote that our data refer to per student income or expenditures.

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The opinions expressed here do not reflect those of either the Ford Foundation or the Trustees of The College of Wooster.

[1] Kenneth A. Simon, et al., *Projections of Educational Statistics to 1976–77*, National Center for Educational Statistics, U.S. Dept. of HEW, Washington, D.C., 1968.
Sidney G. Tickton, "The Magnitude of American Higher Education in 1980," in *Campus 1980*, Alvin C. Eurich, ed., Delacorte Press, New York, 1968.

[2] Fractional FTE students have everywhere been rounded to the nearest whole FTE unit, thus no decimals are used.

Tables 1.A. and 1.B., respectively, present detailed information on aggregate income and aggregate expenses of the colleges in our sample. Tables 2.A. and 2.B. present data on the growth in income and expenses by quartiles on both an aggregate and FTES basis.

TABLE 1.A.—*Summary of total aggregate income—Entire sample*

[In thousands of dollars] [1]

	1960 (23)[2]	1961 (25)[2]	1962 (29)[2]	1963 (29)[2]	1964 (31)[2]	1965 (31)[2]	1966 (31)[2]	1967 (31)[2]	1968 (31)[2]
Tuition and fees	$24,470	$29,691	$38,097	$42,184	$47,941	$54,430	$60,946	$66,557	$72,594
Endowment income	6,532	7,238	9,408	9,597	11,690	13,395	14,238	14,962	16,286
Gifts and grants	4,426	5,190	6,146	7,535	9,907	10,174	11,313	12,054	13,972
Other income	1,264	1,661	2,272	2,333	2,469	2,708	3,133	4,393	4,838
Total, educational and general income	36,691	43,780	55,923	61.649	72,007	80,707	89,631	97,966	107,690
Auxiliary enterprises	17,197	20,616	24,853	26.850	30,165	33,299	36,279	38,994	41,856
Student aid	2,548	2,947	3,664	4,276	4,899	5,536	6,105	7,300	9,013
Intercollegiate athletics	189	201	200	238	353	329	311	303	306
Other educational operations	630	692	829	939	1,099	1,158	1,193	1,222	1,235
Total income	57,255	68,236	85,469	93,953	108,523	121,028	133,519	145,785	160,100
Student aid:									
Gifts	1,383	1,628	1,915	2,298	2,658	3,037	3,347	4,246	5,542
Endowment	1,105	1,268	1,675	1,878	2,145	2,400	2,713	2,967	3,339
Other sources	60	51	74	101	96	99	46	87	133
Total, student aid	2,548	2,947	3,664	4,276	4,899	5,536	6,105	7,300	9,013
Gifts:									
Operating	4,426	5,190	6,146	7,535	9,907	10,174	11,313	12,054	13,972
Student aid	1,383	1,628	1,915	2,234	2,658	3,037	3,347	4,246	5,542
Total	5,809	6,819	8,060	9,768	12,564	13,211	14,660	16,300	19,514
Endowment:									
Operating	6,532	7,238	9,408	9,597	11,690	13,395	14,238	14,962	16,286
Student aid	1,105	1,268	1,675	1,878	2,145	2,400	2,713	2,967	3,339
Total endowment	7,637	8,506	11,083	11,475	13,835	15,794	16,951	17,929	19,625

[1] Total may not add because of rounding.
[2] Numbers in parentheses equal to number of colleges.

TABLE 1.B.—*Summary of total aggregate expenses—Entire sample*

[In thousands of dollars] [1]

	1960 (23)[2]	1961 (25)[2]	1962 (29)[2]	1963 (29)[2]	1964 (31)[2]	1965 (31)[2]	1966 (31)[2]	1967 (31)[2]	1968 (31)[2]
All administration	$9,612	$11,514	$14,623	$16,311	$19,428	$21,507	$23,770	$26,590	$29,139
Instructional	17,866	21,451	26,834	30,006	34,674	38,111	41,852	46,596	51,713
Library	1,635	1,953	2,529	2,902	3,521	3,981	4,376	5,014	5,463
Operation and maintenance	6,430	7,781	9,323	10,346	11,383	12,656	14,102	15,316	16,322
Other educational and general expenses	65	96	94	136	72	82	165	282	227
Total, educational and general expenses	35,609	42,796	53,404	59,702	69,078	76,337	84,265	93,798	102,863
Auxiliary enterprises	15,736	18,631	22,772	24,621	28,015	30,814	33,877	37,389	39,898
Student aid	4,186	4,917	6,300	7,092	8,691	9,795	10,715	12,293	14,474
Intercollegiate athletics	692	772	932	1,030	1,236	1,404	1,513	1,633	1,760
Other educational operations	550	645	845	1,001	1,062	1,114	1,304	1,313	1,345
Total expenses	56,772	67,760	84,253	93,445	108,082	119,463	131,673	146,427	160,341

[1] Total may not add because of rounding.
[2] Numbers in parentheses equal to number of colleges.

TABLE 2.A.—*Aggregate income and expenditures* [1]

[ARITHMETIC MEAN COLLEGE PER QUARTILE]

	Most rapid enrollment growth quartile [2]				2d enrollment quartile [2]			
	Mean 1960	Mean 1968	Total growth (percent)	Annual growth (percent)	Mean 1960	Mean 1968	Total growth (percent)	Annual growth (percent)
INCOME								
Tuition and fees	$588, 346	$1, 728, 356	193. 77	24. 22	$1, 216, 075	$2, 536, 998	108. 62	13. 58
Endowment	169, 775	239, 664	41. 17	5. 15	176, 933	481, 263	172. 00	21. 50
Gifts	140, 761	324, 798	130. 74	16. 34	190, 375	463, 986	143. 72	17. 97
Other	27, 687	134, 749	386. 69	48. 34	58, 298	146, 135	150. 67	18. 83
Educational and general income	926, 569	2, 427. 567	161. 995	20. 25	1, 641, 681	3, 623, 382	121. 02	15. 13
Aux. Ent	412, 341	1, 052, 163	155. 17	19. 40	941, 428	1, 605, 215	70. 51	8. 81
Student aid	88, 418	270, 969	206. 46	25. 81	97, 596	249, 699	155. 85	19. 48
Miscellaneous	13, 600	19, 363	42. 38	5. 30	55, 955	68, 717	22. 81	2. 85
Total income	1, 440, 928	3, 770, 062	161. 641	20. 21	2, 736, 660	5, 552, 013	102. 88	12. 86
EXPENDITURES								
Administration	279, 413	744, 992	166 .63	20 .83	414, 801	911, 464	119 .74	14 .97
Instruction	415, 331	1, 116, 478	168 .82	21 .10	820, 216	1, 812, 832	121 .02	15 .13
Library	36, 807	116, 801	217 .33	27 .17	69, 777	180, 427	158 .58	19 .82
Operation and maintenance	172, 015	361, 026	109 .88	13 .74	261, 174	521, 194	99 .56	12 .44
Educational and general expenses [3]	903, 566	2, 339, 297	158 .90	19 .86	1, 565, 968	3, 425, 917	118 .77	14 .85
Aux. Ent	371, 714	1, 022, 196	174 .995	21 .87	870, 827	1, 467, 533	68 .52	8 .57
Student aid	131, 799	388, 898	195 .07	24 .38	176, 515	469, 857	166 .19	20 .77
Miscellaneous	34, 439	80, 720	134 .39	16 .80	83, 252	156, 027	87 .42	10 .93
Total expenses	1, 441, 518	3, 831, 111	165 .77	20 .72	2, 696, 562	5, 519, 334	104 .68	13 .09
Enrollment total	574	975	68 .86	8 .73	1, 308	1, 559	19 .19	2 .40

	3d enrollment quartile [2]				Slowest enrollment growth quartile [2]			
	Mean 1960	Mean 1968	Total growth (percent)	Annual growth (percent)	Mean 1960	Mean 1968	Total growth (percent)	Annual growth (percent)
INCOME								
Tuition and fees	$1,233,693	$2,644,228	114,33	14.29	$1,239,880	$2,380,683	92.01	11.50
Endowment	399,505	588,492	47.31	5.91	334,826	756,307	125.88	15.74
Gifts	204,004	466,504	128.67	16.08	231,868	531,786	129.35	16.17
Other	71,736	122,176	70.31	8.79	60,468	218,545	261.42	32.68
Educational and general income	1,908,938	3,821,400	100.18	12.52	1,867,042	3,887,321	108.21	13.53
Auxiliary enterprises	921,788	1,582,380	71.66	8.96	750,815	1,123,805	49.68	6.21
Student aid	107,838	259,962	141.07	17.63	145,391	379,888	161.29	20.16
Miscellaneous	39,571	69,680	76.09	9.51	39,325	37,258	−5.26	−.66
Total income	2,978,135	5,733,422	92.52	11.56	2,802,573	5,428,272	93.69	11.71
EXPENDITURES								
Administration	482,703	998,625	106.88	13.36	482,979	1,080,443	123.70	15.46
Instruction	957,793	1,858,711	94.06	11.76	898,159	1,815,662	102.15	12.77
Library	82,723	205,474	148.39	18.55	92,691	194,734	110.09	13.76
Operation and maintenance	312,035	577,636	85.12	10.64	361,537	625,471	73.00	9.13
Educational and general expenses [3]	1,835,254	3,640,446	98.36	12.30	1,835,366	3,716,310	102.48	12.81
Auxiliary enterprises	850,454	1,540,898	81.19	10.15	678,185	1,084,459	59.91	7.49
Student aid	200,440	494,708	146.81	18.35	214,262	504,427	135.43	16.93
Miscellaneous	56,569	596,883	955.14	119.39	51,116	64,643	26.46	3.31
Total expenses	2,942,717	6,272,935	113.17	14.15	2,778,929	5,369,839	93.23	11.65
Enrollment total	1,376	1,636	18.90	2.36	1,325	1,440	8.68	1.09

[1] Calculations are based on our raw data.

[2] The 31 colleges were divided into quartiles based on their enrollment growth from 1960 to 1968. The 1st quartile includes those schools with the most rapid enrollment growth, the last quartile those with the slowest growth, etc.

[3] "Other educational and general" expenses which are relatively small are not included in this table.

TABLE 2.B.—*FTES income and expenditures*[1]

[ARITHMETIC MEAN COLLEGE PER QUARTILE]

	Most rapid enrollment growth quartile[2]				2d enrollment quartile[2]				3d enrollment quartile[2]				Slowest enrollment growth quartile[2]			
	Mean 1960 FTES (dollars)	Mean 1968 FTES (dollars)	Total mean growth (percent)	Annual mean growth (percent)	Mean 1960 FTES (dollars)	Mean 1968 FTES (dollars)	Total mean growth (percent)	Annual mean growth (percent)	Mean 1960 FTES (dollars)	Mean 1968 FTES (dollars)	Total mean growth (percent)	Annual mean growth (percent)	Mean 1960 FTES (dollars)	Mean 1968 FTES (dollars)	Total mean growth (percent)	Annual mean growth (percent)
Income:																
Tuition and fees	1,024	1,773	73.14	9.14	930	1,627	74.95	9.37	897	1,616	80.16	10.02	936	1,654	76.71	9.59
Endowment	295	246	−16.61	−2.08	135	309	128.89	16.11	290	360	24.14	3.02	253	525	107.51	13.44
Gifts	245	333	35.92	4.49	146	298	104.11	13.01	148	285	92.57	11.57	175	369	110.86	13.86
Other	48	138	187.50	23.44	45	94	108.89	13.61	52	75	44.23	5.53	46	152	230.43	28.80
Educational and general income	1,612	2,490	54.47	6.81	1,256	2,328	85.35	10.67	1,387	2,336	68.42	8.55	1,410	2,700	91.49	11.44
Aux. ent	717	1,080	50.63	6.33	720	1,030	43.06	5.38	670	967	44.33	5.54	567	781	37.74	4.72
Student aid	154	278	80.52	10.06	75	160	113.33	14.17	78	159	103.85	12.98	110	264	140.00	17.50
Miscellaneous	24	20	−16.67	2.08	43	44	2.33	.29	29	43	48.28	6.03	30	26	−13.34	1.67
Total income	2,507	3,868	54.29	6.79	2,094	3,562	70.11	8.76	2,164	3,505	61.97	7.75	2,117	3,771	78.13	9.77
Expenditures:																
Administration	486	764	57.20	7.15	317	585	84.54	10.57	351	610	73.70	9.22	364	751	106.32	13.29
Instruction	723	1,146	58.51	7.31	627	1,163	85.49	10.69	696	1,136	63.22	7.90	678	1,261	85.99	10.75
Library	64	120	87.50	10.94	53	116	118.87	14.86	60	126	110.00	13.75	70	135	92.86	11.61
Operation and maintenance	299	370	23.75	2.97	200	334	67.00	8.38	227	353	55.51	6.94	273	435	59.34	7.42
Education and general expenses[3]	1,572	2,400	52.67	6.58	1,197	2,198	83.63	10.45	1,334	2,225	66.79	8.35	1,385	2,582	86.43	10.81
Aux. ent	647	1,049	62.13	7.77	666	941	41.29	5.16	618	942	52.43	6.55	511	753	47.36	5.90
Student aid	229	399	74.24	9.28	135	301	122.96	15.37	146	302	106.85	13.36	162	350	116.05	14.52
Miscellaneous	60	83	38.33	4.79	64	100	56.25	7.03	41	59	43.90	5.49	39	45	15.38	1.92
Total expenses	2,508	3,931	56.74	7.09	2,062	3,540	71.68	8.96	2,139	3,528	64.94	8.12	2,097	3,730	77.87	9.73

[1] Calculations are based on our raw data.

[2] The 31 colleges were divided into quartiles based on their enrollment growth from 1960 to 1968. The 1st quartile includes those schools with the most rapid enrollment growth, the last quartile those with the slowest growth, etc.

[3] "Other education and general" expenses which are relatively small are not included in this table.

a. Annual growth of aggregate income and expense (from table 2.A.)

[In percent]

Item	1st quartile	2d quartile	3d quartile	4th quartile	Total
Educational and general income	20.25	15.13	12.52	13.53	14.72
Total income	20.21	12.86	11.56	11.71	13.43
Educational and general expense	19.86	14.85	12.30	12.81	14.29
Total expense	20.72	12.86	11.56	11.71	13.69
Enrollment	8.73	2.40	2.36	1.09	3.00

The aggregate enrollment for the group rose by 8.39 percent annually; this figure, however, is not properly weighted because in the early years we are missing data for several colleges. The quartile and corresponding total enrollment growth percentages in summary table a. above discount the changing number of colleges.

b. Annual growth of FTES income and expense (from table 2.B.)

[In percent]

Item	1st quartile	2d quartile	3d quartile	4th quartile	Total
Educational and general income	6.81	10.67	8.55	11.44	9.45
Total income	6.79	8.76	7.75	9.77	8.41
Educational and general expense	6.58	10.45	8.35	10.80	9.69
Total expense	7.09	8.96	8.12	9.73	9.20

We wish to call the reader's attention especially to the differing growth rates in each quartile, a fact which was taken into account in our approach to the expense projections. At present there is very little evidence to suggest substantially *lower* future expenditure growth than that experienced during recent years. To the contrary, many factors seem to point to accelerating expense growth (see Section III, below).

Tables 3.A. and 3.B. reproduce what we call the "Representative Mean College" income and expenditures. The figures were obtained by dividing aggregate income and expenditure data by the number of colleges in the sample and, for the FTES data, by the number of students in the sample each year.

In the "Representative Mean College" total income and expenditures grew as follows:

	Mean annual growth (percent)
Educational and general income	14.72
All income	13.43
FTES educational and general income	9.45
All income	8.41
Aggregate educational and general expense	14.29
All expense	13.69
FTES educational and general expense	9.12
All expense	8.64

Table 3.A.—*Aggregate income for "representative mean college"* [1]

	1960 (23)[2]	1961 (25)[2]	1962 (29)[2]	1963 (29)[2]	1964 (31)[2]	1965 (31)[2]	1966 (31)[2]	1967 (31)[2]	1968 (31)[2]	Aggregate 1960-68 growth (percent)	Mean annual growth (percent)
Tuition and fees	$1,063,892	$1,187,648	$1,313,704	$1,454,626	$1,546,477	$1,755,798	$1,966,003	$2,146,989	$2,341,734	120.11	15.01
Endowment	283,994	289,515	324,412	330,937	377,099	432,082	459,298	482,648	525,360	84.99	10.62
Gifts and grants	192,426	207,617	211,917	259,812	319,572	328,201	364,934	388,845	450,703	134.22	16.78
Other	54,964	66,425	78,355	80,453	79,658	87,369	101,074	141,703	156,067	183.94	22.99
Total, educational and general, income	1,595,276	1,751,205	1,928,388	2,125,828	2,322,805	2,603,450	2,891,300	3,160,185	3,473,864	117.76	14.72
Auxiliary enterprises	747,703	824,626	856,995	925,850	973,074	1,074,168	1,170,283	1,257,885	1,350,204	80.58	10.07
Student aid	110,787	117,871	126,332	147,458	158,022	178,577	196,950	235,478	290,748	162.44	20.31
Miscellaneous	35,583	35,722	35,483	40,612	46,855	47,950	48,530	49,189	49,703	39.68	4.96
Total income	2,489,349	2,729,424	2,947,198	3,239,748	3,500,756	3,904,145	4,307,073	4,702,737	5,164,519	107.46	13.43
FTES income for "representative mean college"											
Tuition and fees	$932	$1,010	$1,111	$1,199	$1,294	$1,366	$1,466	$1,567	$1,654	77.47	9.68
Endowment	249	246	274	273	315	336	343	352	371	49.00	6.13
Gifts and grants	168	177	179	214	267	255	272	284	318	89.29	11.16
Other	48	56	66	66	67	68	75	103	110	129.17	16.15
Total, educational and general, income	1,397	1,489	1,631	1,753	1,944	2,026	2,156	2,307	2,453	75.50	9.45
Auxiliary enterprises	655	701	725	763	814	836	873	918	954	45.65	5.71
Student aid	97	100	107	122	132	139	147	172	205	111.34	13.92
Miscellaneous	31	30	30	33	39	37	36	36	35	12.90	1.61
Total income [3]	2,180	2,321	2,493	2,671	2,930	3,038	3,212	3,433	3,647	67.29	8.41
Enrollment (mean)	1,142	1,176	1,182	1,213	1,195	1,285	1,341	1,370	1,416	23.99	2.9987
Aggregate enrollment	26,263	29,412	34,273	35,166	37,059	39,849	41,559	42,472	43,901	67.15	8.3948

[1] Representative mean college equals aggregate income from table 1B divided by number of colleges in sample.

[2] Numbers in parentheses equal to number of colleges making up the aggregate in table 1B each year.

[3] Totals may vary due to difference in rounding figures.

TABLE 3.B.—*Aggregate expense for "representative mean college"* [1]

	1960 (23)[2]	1961 (25)[2]	1962 (29)[2]	1963 (29)[2]	1964 (31)[2]	1965 (31)[2]	1966 (31)[2]	1967 (31)[2]	1968 (31)[2]	Aggregate 1969–68 growth (percent)	Mean annual growth (percent)
Administration	$417, 934	$460, 549	$504, 243	$562, 444	$626, 706	$693, 762	$766, 775	$857, 757	$939, 974	124. 90	15. 61
Instruction	776, 798	858, 047	925, 317	1, 034, 706	1, 118, 523	1, 229, 397	1, 350, 065	1, 503, 110	1, 668, 161	114. 75	14. 34
Library	71, 094	78, 115	87, 221	100, 086	113, 581	128, 428	141, 160	161, 749	176, 216	147. 86	18. 48
Operation and maintenance	279, 576	311, 255	321, 490	356, 741	367, 195	408, 251	454, 908	494, 058	526, 503	88. 32	11. 04
Other	2, 805	3, 854	3, 240	4, 706	2, 311	2, 648	5, 308	9, 082	7, 312	160. 68	20. 09
Total educational and general expense [2]	1, 548, 207	1, 711, 820	1, 841, 510	2, 058, 684	2, 228, 316	2, 462, 486	2, 718, 217	3, 025, 756	3, 318, 166	114. 32	14. 29
Auxiliary enterprises	684, 169	745, 239	785, 237	848, 992	903, 724	993, 995	1, 092, 809	1, 206, 108	1, 287, 048	88. 12	11. 02
Student aid	181, 978	196, 662	217, 250	244, 537	280, 344	315, 971	345, 636	396, 534	466, 910	156. 57	19. 57
Miscellaneous	54, 014	56, 677	61, 276	70, 033	74, 123	81, 203	90, 857	95, 041	100, 176	85. 46	10. 68
Total expenses [3]	2, 468, 368	2, 710, 398	2, 905, 273	3, 222, 246	3, 486, 506	3, 853, 655	4, 247, 519	4, 723, 439	5, 172, 300	109. 54	13. 69

FTES expense for "representative mean college"

	1960 (23)[2]	1961 (25)[2]	1962 (29)[2]	1963 (29)[2]	1964 (31)[2]	1965 (31)[2]	1966 (31)[2]	1967 (31)[2]	1968 (31)[2]	Aggregate 1969–68 growth (percent)	Mean annual growth (percent)
Administration	$366	$392	$427	$464	$524	$540	$572	$626	$664	81. 42	10. 18
Instruction	680	730	783	853	936	957	1, 007	1, 097	1, 178	73. 24	9. 16
Library	62	66	74	83	95	100	105	118	124	100. 00	12. 50
Operation and maintenance	245	265	272	294	307	318	339	361	372	51. 84	6. 48
Other	2	3	3	4	2	2	4	7	5	150. 00	18. 75
Total educational and general expense [3]	1, 355	1, 456	1, 559	1, 698	1, 864	1, 917	2, 027	2, 209	2, 343	72. 92	9. 12
Auxiliary enterprises	599	634	664	700	756	774	815	880	909	51. 75	6. 47
Student aid	159	167	184	202	235	246	258	289	330	107. 55	13. 44
Miscellaneous	47	48	52	58	62	63	68	69	71	51. 06	6. 38
Total expense [3]	2, 160	2, 305	2, 459	2, 658	2, 917	3, 000	3, 168	3, 447	3, 653	69. 12	8. 64
Enrollment (mean)	1, 142	1, 176	1, 182	1, 213	1, 195	1, 285	1, 341	1, 370	1, 416		
Aggregate enrollment	26, 263								43, 901		

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[1] Representative mean college equal to aggregate expense from table 1B divided by number of colleges in sample.

[2] Numbers in parentheses equal to number of colleges making up the aggregate in table 1B each year.

[3] Totals may vary due to difference in rounding figures.

II. PROJECTIONS OF EXPENDITURES UNDER VARYING ENROLLMENTS

As we reach this point of our study we must attest once again to the as yet incomplete status of our investigations. To date we have not had enough time to submit our information to the kind of statistical manipulations which are necessary in order *to build into our expenditure projections the theory which* we see emerge from a few of the highlights suggested by the foregoing tables and by our paper, "Short Run Cost Variations in Institutions of Higher Learning," which also appears in this collection.

In order to make some expenditure projections we have therefore taken a shortcut. In place of statistical projection methods we have made graphic sight-projections which can be seen on the attached Linear Expenditure Projection Maps (LEPM). For purposes of a first approximation, the method is sufficiently accurate and will provide useful enough alternatives.

1. ENROLLMENT VARIATIONS

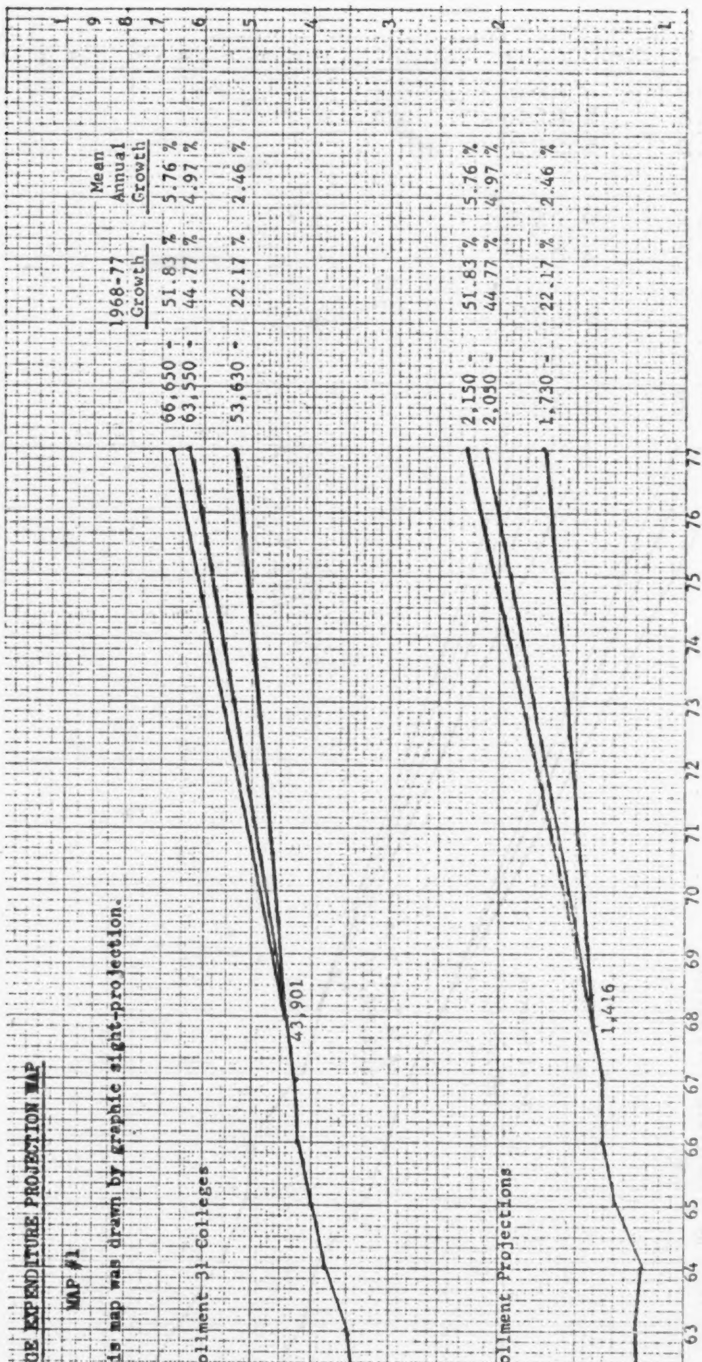
The (linear) mean annual enrollment increase for the "average" or "representative" college has been 2.99 percent (or 23.9929 percent for the period). For the sample of 31 colleges, aggregate enrollment has had a total linear growth of 67.1591 percent or 8.3948 percent annually. Some of this increase results because fewer than 31 colleges appear in the sample prior to 1964. (See table 3A.)

In surveying the colleges in our sample, we obtained relatively little useful information concerning their future enrollment growth plans. Seventeen colleges in our sample responded that they anticipated *no* enrollment growth between now and 1975; only 6 schools appeared to have made well thought-out estimates of future student populations. We do not think that we should rely too heavily on these responses.

We have therefore drawn on our LEPM (Map 1) three possible enrollment projections (lowest three lines), consisting of what we consider to be "likely, reasonable possibilities," and obtain the following results:

	1967–68	1976–77	Mean annual growth (percent)[1] (1967–68 through 1976–77)
Representative college: Enrollment	1, 416	2, 150	5. 7595
	1, 416	2, 050	4. 9748
	1, 416	1, 730	2. 4639
31 colleges, aggregate: Enrollment	43, 901	66, 650	5. 7576
	43, 901	63, 550	4. 9730
	43, 901	53, 630	2. 4623

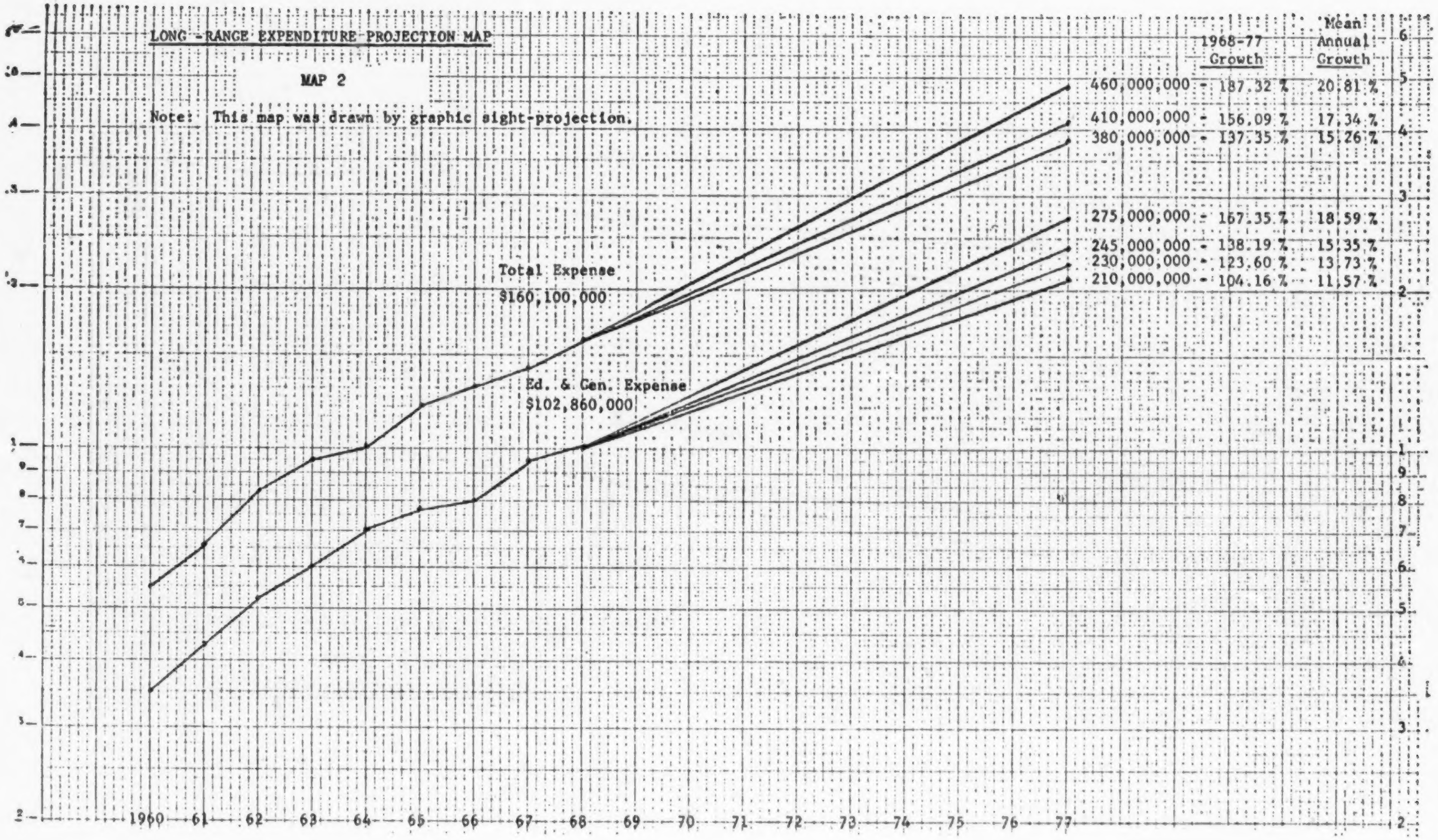
[1] The mean annual percentage growth was calculated by dividing 1967–68 enrollment into 1976–77 enrollment to obtain a total linear growth; this result was divided by 9 (the years enrollment changed). For example, the first line is: 2,150/1,416=51.8362 percent total growth; 51.8362/9=5.7595 percent annual growth.



LONG-RANGE EXPENDITURE PROJECTION MAP

MAP #1

Note: This map was drawn by graphic sight-projection.



LONG -RANGE EXPENDITURE PROJECTION MAP

MAP 2

Note: This map was drawn by graphic sight-projection.

Provided Student Aid is available to each college to an increasing extent, we should assume (1) that enrollment for this group of institutions will at least remain at the current level, and (2) that it will increase during the 1970's at about the 1960–68 average annual rate. For planning or projection purposes, it may therefore be adequate to expect a future resources need for an enrollment of at least somewhere between 53,630 and 63,550. In the following we shall include the higher targets as well; if they do not materialize no damage will have been done: it is better to overestimate future income requirements rather than to underestimate them, as has been done far too often in the past. We shall return to this point in Section III.

From the LEPM (Map 2) we obtain the following Educational and General and Total Expense targets for 1976–77 (based on an estimation procedure much the same as that followed in obtaining the enrollment projections):

	1976–77	Mean annual growth, 1967–68 through 1976–77 (in percent)	Mean annual growth, 1960 through 1968 (in percent)
Educational and general expense:			
A	$275,000,000	18.59	14.29
B	245,000,000	15.35	14.29
C	230,000,000	13.73	14.29
D	210,000,000	11.57	14.29
Total expense:			
E	460,000,000	20.81	13.69
F	410,000,000	17.34	13.69
G	380,000,000	15.26	13.69

From these aggregates we in turn obtain the following three models relative to each enrollment target:[1]

ENROLLMENT, 53,630 FTES FOR EACH EXPENDITURE AGGREGATE

	Expenditure	FTES expense figures	Percent
Map 3a:[1]			
A	$5,128	[2] 2,343	13.21
B	4,568		10.55
C	4,289		9.23
D	3,916		7.46
E	8,577	[2] 3,652	14.98
F	7,645		12.15
G	7,086		10.45

[1] See LEPM, map 3, pts. a–c.

[2] These are FTES expense figures for 1967–68 used as a base in calculating the mean annual growth percentages.

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[1] **The annual FTES growth rates for these models were calculated as follows:**

a. The projected expenditures were divided by projected enrollments, yielding an FTES cost for each model.

b. This FTES cost was divided by the 1967–68 base FTES cost to obtain a total growth rate.

c. The total growth rate was divided by nine, giving us the annual percentage growth rate.

For Model A:

a. $$\frac{\$275{,}000{,}000}{53{,}630} = \$5{,}128 \textit{ FTES} \text{ cost.}$$

b. $$\frac{\$5{,}128}{2{,}343} = 118.86\% \text{ Total growth.}$$

c. $$\frac{118.86\%}{9} = 13.21\% \text{ Annual growth.}$$

ENROLLMENT, 63,550: FTES FOR EACH EXPENDITURE AGGREGATES

	Expenditure	FTES expense figure	Percent
Map 3b:[1]			
A	$4,327	[2] 2,343	9.41
B	3,855		7.17
C	3,619		6.05
D	3,304		4.56
E	7,238	[2] 3,652	10.91
F	6,452		8.52
G	5,980		7.08

ENROLLMENT, 66,650: FTES EXPENSE FOR EACH EXPENDITURE AGGREGATE

	Expenditure	FTES expense figure	Percent
Map 3c:[1]			
A	$4,126	[2] 2,343	8.46
B	3,676		6.32
C	3,451		5.25
D	3,151		3.83
E	6,902	[2] 3,652	9.89
F	6,152		7.61
G	5,701		6.23

[1] See LEPM, map 3, pts. a–c.

[2] These are FTES expense figures for 1967–68 used as a base in calculating the mean annual growth percentages.

It is appropriate to remember here that for our sample the annual FTES expense growth was as follows for the period as a whole:

Education and General Expenses	9.69
Total Expense	9.20

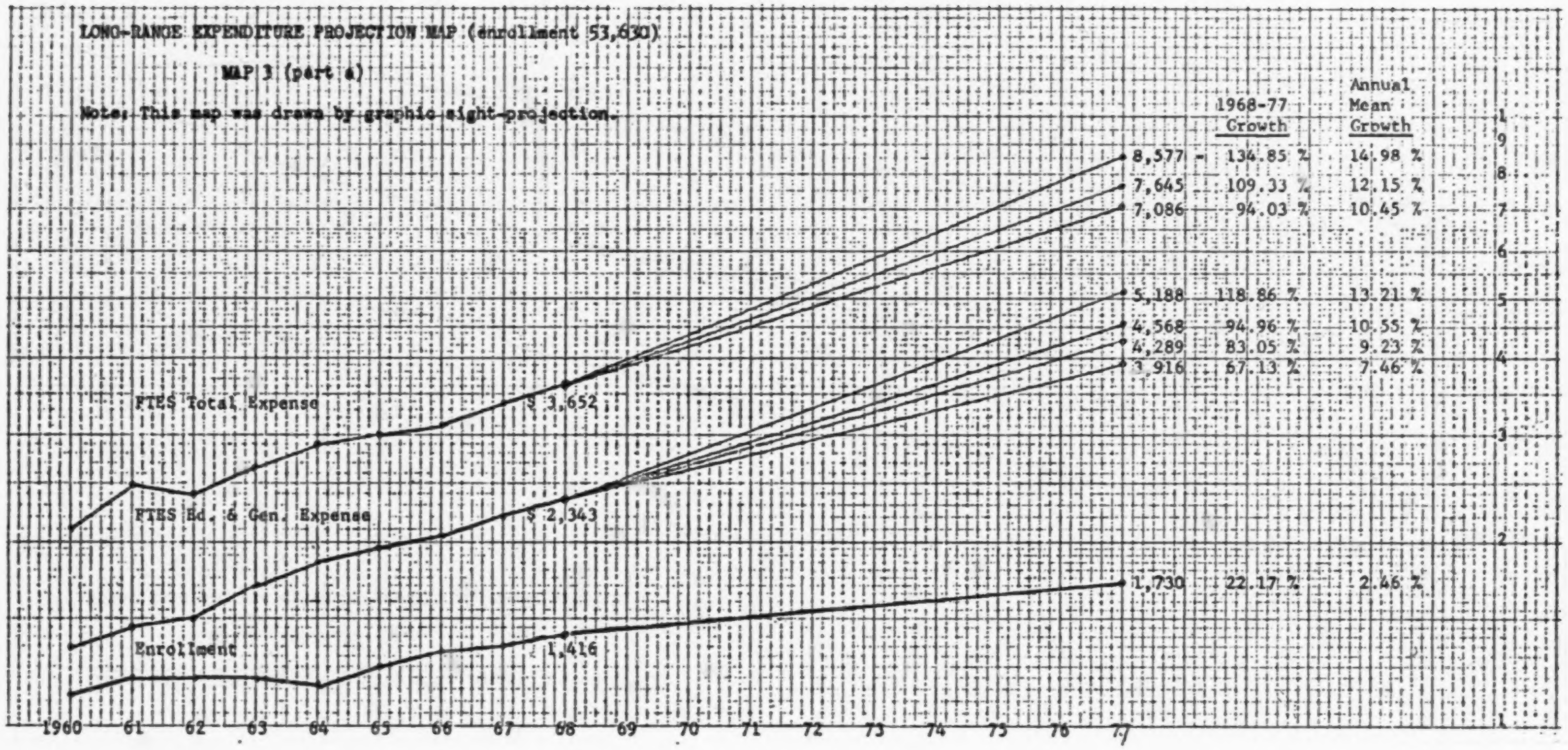
We could therefore conclude, among other things, that our projections should at least include FTES expense growth models which approach a mean annual growth rate of between 9 and 10 percent. Since our enrollment variations include for each FTES cost one or more models of this type, we can assume that our LEPM provides us with a reasonably realistic first guess concerning future income requirements.

The sample of 31 colleges showed sharply differing income and expense growth rates. In order to establish a reasonably realistic set of projections, we inquired about enrollment expectations, but received rather useless information. We thus were forced to make our own assumptions:

a. Enrollment could be expected to grow somewhere between two extremes, based on experience; we chose three projections which are well within the sample's growth pattern: (1) two relatively fast enrollment growth rates typical of about 40% of the sample, and (2) one mean growth rate similar to that of the "Representative Mean College." (See notes, tables 3.A. and 3.B.)

b. Expenditure growth varies from enrollment quartile to quartile (tables 2.A. and 3.B.), and we chose several possibilities which again correspond fairly well to mean annual growth rates experienced in the sample; projections by the colleges themselves were available in but a few cases and they tended to be unconvincing for the most part.

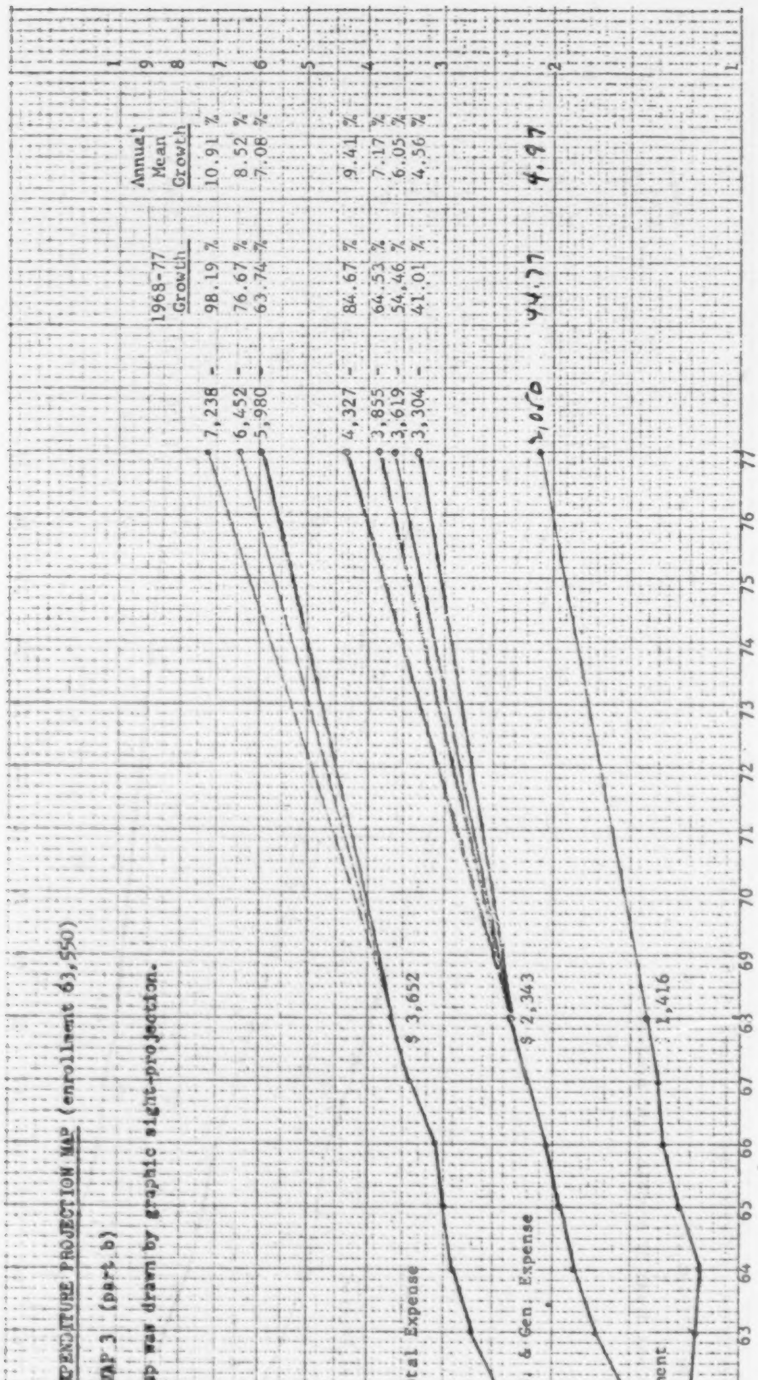
We now turn to some modifications and comments which are appropriate in an effort of long range resources definition for institutions of higher learning.

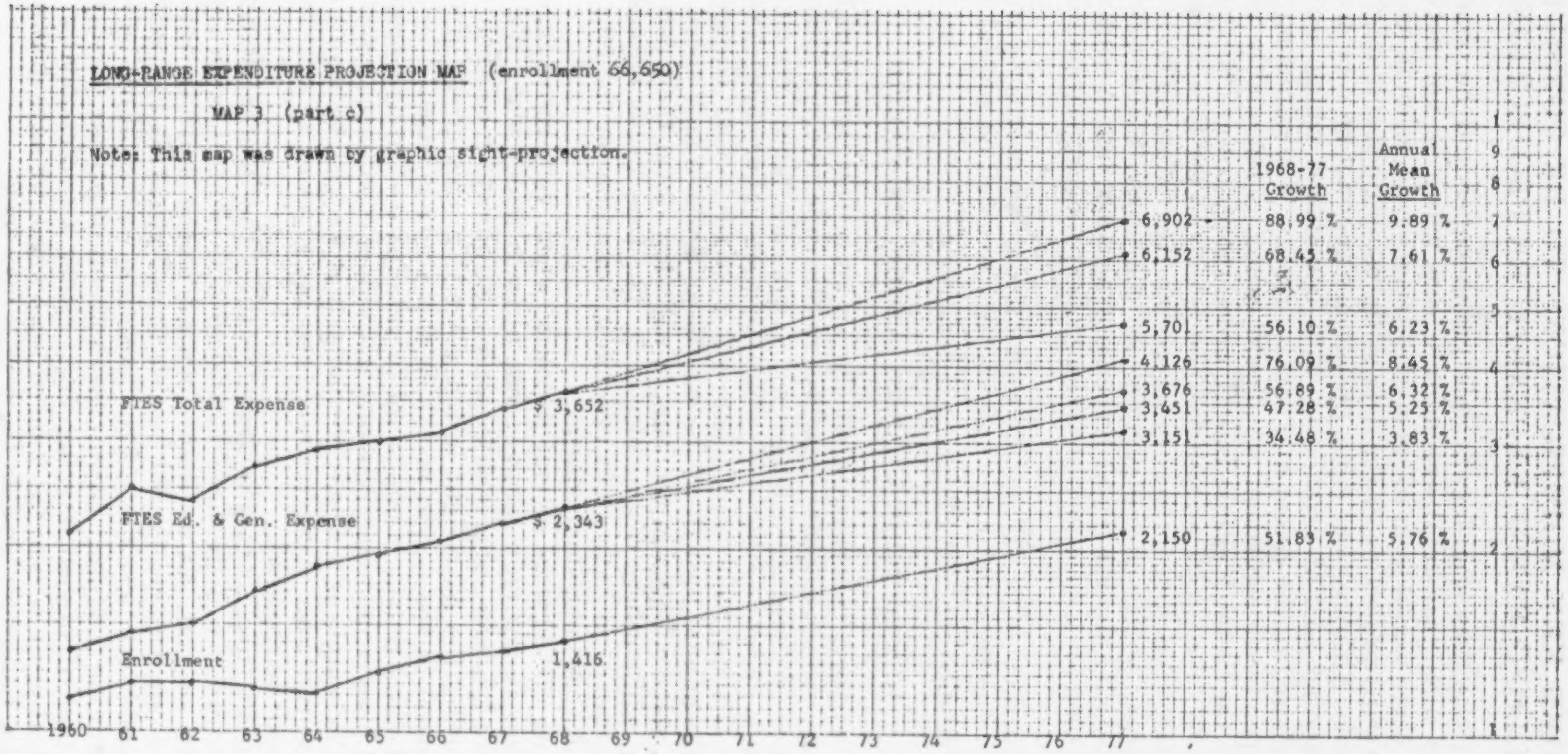


LONG-RANGE EXPENDITURE PROJECTION MAP (enrollment 53,630)

MAP 3 (part a)

Note: This map was drawn by graphic sight-projection.


LONG-RANGE EXPENDITURE PROJECTION MAP (enrollment 63,550)
MAP 3 (part b)
Note: This map was drawn by graphic sight-projection.
FTES Total Expense
FTES Ed. & Gen. Expense
Enrollment
$ 3,652
$ 2,343
1,416
1960
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
1
9
8
7
6
5
4
3
2
1
1968-77 Growth
Annual Mean Growth
7,238 - 98.19 % 10.91 %
6,452 - 76.67 % 8.52 %
5,980 - 63.74 % 7.08 %
4,327 - 84.67 % 9.41 %
3,855 - 64.53 % 7.17 %
3,619 - 54.46 % 6.05 %
3,304 - 41.01 % 4.56 %
2,050 94.77 4.97



LONG-RANGE EXPENDITURE PROJECTION MAP (enrollment 66,650)

MAP 3 (part c)

Note: This map was drawn by graphic sight-projection.

III. SOME KEY MODIFICATIONS TO BE CONSIDERED IN LONG RANGE EXPENDITURE PROJECTIONS

When one uses semi-logarithmic graph paper and he obtains an eight to nine year total expenditure line which is not noticeably curved, there would seem to exist substantial justification in assuming that forward projection of the data at the established rate might look reasonable. Although our sight-projections may not be very accurate, the foregoing LEPM provide us with boundaries which are fairly well anchored in the recent and current reality. The minimum aggregate expenditure escalation we should expect is reasonably well defined by the Total Expense line G which moves toward $380,000,000 by 1976–77. The projected $210,000,000 minimum for Educational and General expense appears to be quite modest from what we know of the recent past. As far as the maxima are concerned, $460,000,000 may seem excessive for the Total Expense projection, but in contrast the $275,000,000 for Educational and General expenses appear more nearly in reach.

The final outcome will be interesting to observe once the years have gone by. In the meantime, we should like to dwell on several factors which our specific lines on the LEPM's may ignore.

1. Structural Changes Within the Sample

In our paper, "Short-run Cost Variations in Institutions of Higher Learning," which appears elsewhere in this collection, we discuss several types of structural changes which can take place over time; one of these is of interest here: if several of the smaller colleges begin to try to escalate their enrollments substantially, other things being equal, the annual growth of the sample as a whole may speed up. In reality, some colleges in the sample will slow down their enrollment growth, while others will accelerate it. The true mix is impossible to forecast until we have more reliable information on the long range plans of each individual college.

But we do know of several instances where very rapid enrollment escalation is not only planned but already under way. We should therefore be quite surprised to see less enrollment escalation on balance during the next eight to ten years than this group of colleges experienced in the period on which this study is based.

We believe that it is important to anticipate—through proper and careful long range planning—how individual enrollment growth rates affect the sample as a whole, particularly if we wish to have a reasonably accurate idea of *the amounts and the types of specific resources which will be required.*

Different enrollment growth rates affect the internal structure of expenditures, be it in the Educational and General or in the Total Expense account. As we move forward in the in-depth analysis of some of our data we should be able to call attention to specific relatively stable relationships. In the meantime we should not be satisfied with defining the future income requirements of private (or any other) institution of higher learning from either a professionally perfect statistical projection or the kind of lines which we have drawn on our LEPM's, however plausible the results may look.

In estimating future educational expenditures we are not interested solely in whether appropriate amounts of money will be ready when needed; *we must have available the right kinds of resources.* Projections from broad aggregates tend to hide rather than to reveal these specific qualitative needs. An analogy with the national economy may be appropriate here. The GNP will rise whether we escalate private or public spending; it may rise faster or more slowly depending on which we emphasize more, but the more we spend either way, the larger will be the GNP. The real issue, however, is not so much in whether the total GNP increases, but in what happens within the structure of the GNP.

We make this point in part because we believe that the requirements for more resources for higher education as a whole have been well publicized, recognized and supported. We think that as a Nation we are less well aware of where the new money should be allocated *within* the educational structure or system. Are we interested in quantitative growth? Are we concerned with qualitative improvements? What degree of diversity between small and large, public and private, institutions do we think is desirable and therefore in need of support?

Specific answers have been given by means of public policy support of private higher education to several questions of the type just suggested. For instance, much financial aid has come to those who were willing to increase their enrollments. Equipment and research grants to science departments have enabled some of the smaller liberal arts colleges to maintain course offerings in these areas without pricing themselves even further out of certain student markets. During the last two to three years there can also be seen a broadening of the list of educational ventures which seem to be deserving of public support.

All of this has had an influence on the policies of the educational institutions in our sample, and in turn there has been a significant effect on the income and expenditure structure as a whole and individually. One striking fact, which we may try to demonstrate in another study, is that the colleges in our sample have benefitted most unevenly from the public munificence. Instead of upgrading the weak, much of the grantsmanship has further strengthened the already strong, and we are not referring here to financial upgrading. In some instances, public support has produced unwise private policies. Many a private college has been tempted for often complex reasons into going after public funds; in so doing it acquiesced to policies which it really did not want to get involved in. But money pressures were such that . . . etc., etc.

Careful study and forecasting of the structural changes which are expected within the total sample appear to be important to us after we have been exposed to the individual characteristics of the colleges and to the very special and specialized financial requirements of each. In this sense, then, we should expect our projections to be subject to substantial long range alterations.

2. CHANGES IN EDUCATIONAL TECHNOLOGY

One of the more significant limitations of traditional projection methods is, in our view, their almost total neglect in anticipating changes in educational technology.

When we state the matter as bluntly as this, we should not like to suggest that we have lost our sense of humor. Among other things, we are aware of the fact that educational technology has not changed and is not going to change very rapidly at the college level. But one of the special advantages which public policy has is its ability to encourage experimentation, as well as the practice of those methods and techniques which have proved to be effective after careful research and testing.

The main reason why we think one should pay attention to changing educational technology in projecting future income requirements is the fantastic capital and operating resources requirements which the very thought of it entails. The reader can free himself from the notion that what we are talking about is the man-become-slave-to-the-machine kind of technology! Instead, what we have in mind is the machine—and the technique—which frees man from the mechanical, the repetitive, the drudgery, all of the things which take him away from his creative teaching functions and learning process.

In some of the more cost-conscious circles the question has been asked how the teacher can be made more productive. In many applications the machine (not inevitably, the teaching machine) will do just that, in the same way it has done it in other fields. Man by himself does not increase his basic productivity after he has reached a specific point in his professional development. Certain types of equipment will improve his productivity, often quite substantially both in quantity and quality.

But when we raise the matter of educational technology in relation to institutions of higher learning, we have more complex and promising things in mind. For instance, we think of the future Library as an information storage and retrieval system which has no immediate geographic boundaries. Or we think of the computer and the computer terminal as instantly available office, classroom and study room buddies enabling student and teacher quick access to information in almost any kind of course. And we think of those future dormitories which will have piped into them a constant stream of video-and-sound-tape educational, recreational and other programs. We could be on the threshold of an era in higher education where more students will learn more things faster thanks to modern educational technology than anything we can now see in effect at the colleges in our sample.

Well, the technological revolution which makes possible what we have listed (and more) is already in progress. The products can be bought, and the methods are available to be learned. It would be shortsighted, indeed, to ignore the financial implications of this new technology, mostly because it would be sad to assume that the colleges in our sample will not make use of it increasingly.

The consequences are relatively simple: our projection lines do not reflect sufficiently the sharply increased aggregate costs which this technological development will entail, except perhaps in the $460,000,000 line for Total Expenses. The colleges which have gone into the "computer business" can testify to the fact that this type of cost is almost without exception underestimated by wide margins. The expenditure projections available today, even those based on some degree of long range planning, tend to ignore or significantly to understate the resources which will have to be mobilized in order to make effective the marvelous technology which is now becoming available.

3. New Aspects in Capital Development

Although our projections are limited to the operating account, we cannot ignore several aspects of capital development which are involved. Two of the more significant prospects will be singled out here.

First, debt service for non-income earning plant assets will become a more important element in private college expenditures than has been the case during the period studied. Our projections reflect only what is going on now, but not the scope of what may be happening. As we move toward tax-exempt interest yielding bonds issued by State agencies (i.e., Ohio Educational Facilities Commission), interest subsidies, and the pressure for capital to build new plant, renovate old buildings, and purchase expensive equipment, an *operating expense for debt service* may become an ever more significant element for many institutions in our sample.

Second, major plant renovation efforts and equipment replacement may entail rapidly rising costs which, in the absence of gifts or loans, may have to come out of current income. Although colleges were warned by Sidney G. Tickton many years ago to start building up small and increasingly larger reserves for such purposes, very few schools have made much headway toward any realistic capital replacement contingency. Our projections, therefore, require substantial additions if one of our aims is to estimate future income requirements for these obvious types of expenditures. It does not matter much, in this case, that these are in fact capital expenditures. As long as they must be financed from current gifts, they need be included, and we are therefore understating significantly our financial requirements.

4. New Academic Programs

Another important shortcoming of statistical and sight-projections is their inability to identify forthcoming new academic developments which will require substantial new funds. The problem is similar to that involving educational technology.

Again, our maximum aggregate or FTES expense targets do not take into account what may become fairly hefty monetary requirements for the introduction of experimental, and the development of proven, new academic ventures.

Two recent examples stand out. Who would have thought at the beginning of the 1960's that urban studies and black culture academic offerings would begin to expand through the typical liberal arts curriculum?

And it would, indeed, be a wasteful exercise to hope that such additions will in the future be introduced by eliminating any major program now in force. The academic world does not operate in this manner, such that we must plan to *add net to* the total cost of such innovation.

5. Development of Administrative Capabilities of College

The final example requiring a significant modification in our LEPM lines pertains to the need for substantial upgrading in many of the colleges in our sample of the administrative apparatus. In many ways, some of the institutions are very much understaffed administratively and underserviced, or both. Above all else, many lack the highly skilled personnel which some of our modern management tasks require.

In this respect, our sample is perhaps not as representative of private colleges in general as one might wish it to be. On balance the administrative expense component has moved forward rather well. At any rate, our expenditure projections incorporate only a fraction of the administrative cost potential which is actually inherent in the system. Thus, again, our target figures may err on the low side.

IV. CONCLUSION

Here we should like to restate what must be all too obvious by now: projections of future expenditures which have the object of defining future income requirements will fall far short of a realistic target if they are based on past occurrences. Traditional statistical projections and our own linear sight-projection lines fall under this limitation.

We do not wish to suggest that they are therefore without value. Their worth, however, is limited to creating an other-things-being-equal frame of reference. Established and developing trends become visible, and in the absence of significant changes in the underlying elements, they will have proved to be useful forecasts of probable results. Today, in a rapidly evolving social, economic, and political environment, in a world of economic development, sporadic localized warfare, the recurring danger of revolution, and at a time of potentially wide ranging technological change in education, we cannot take established trends for granted. Therefore, we must supplement our projections by other means.

The most promising of these is *careful long range planning of th individual college as an integrated system.* In order to provide college administrators, private foundations, and legislatures with an idea of the comprehensive operating income requirements of our institutions of higher education, history must be supplemented with careful and continuous planning.

This cannot be done from broad, anonymous, and general aggregates. Long range planning must start with the individual institution. Eventually, it is the sum total of carefully defined and drawn up plans for, say a five to ten year standard length of time, which will inform of the aggregate income requirements for a given group of institutions.

While we are on this point, we should like to suggest that we reexamine the conventional sub-groupings which have become standard fare in our national statistics on higher education. Our traditional geographical groupings, our characteristic associations, and even the breakdown by size of enrollment may not at all be the most appropriate foundation for a well thought-through data base for long range educational income requirements. We hope that, as this study progresses, some alternatives can be suggested. We have used enrollment growth as a possibility here, but we hasten to add that this does not represent a conviction on our part. It was merely convenient. We can definitely say one thing, however; traditional listings and categories have hindered rather than helped us so that we discarded them without regret at least for the time being.

Colleges with large endowments seem to have certain common characteristics; similarly do those with rich constituencies. Fast growing schools offer certain parallels, and institutions which have above average American Association of University Professors salary rankings. Maybe there is something of a theory there and we shall eventually try to find it.

As for long range planning, we were given a few years ago a very satisfactory and relatively simple model, to wit the Ford Foundation College Profile or the Sidney G. Tickton model. It has provided an introduction to long range planning to several hundred private institutions. Since then many useful new models and approaches have been introduced, among others, program budgeting and cost-benefit analysis, and some of these involve sophisticated computer assistance.

Unfortunately, for many a college of the type contained in our sample, long range planning has remained a one shot affair. The Tickton model provided the hope for a payoff of substantial magnitude and it was therefore a powerfully motivated model. Today such an incentive is lacking. We suggest that worse things could happen than a renewal of tying the private colleges' long range planning efforts to the possibility of obtaining major matching grants without any further strings attached except that a well executed and documented long range plan be continually updated.

In the absence of such an incentive, many college administrators will shy away from the expense, the agony, and the endless committee meetings. After all, they know well enough that tomorrow will be "darn" expensive. So why try being precise about it? Because we do not share this resigned point of view, we have offered the foregoing projections and modifications.

V. APPENDIX

The income and expense components of this chapter are based on the classification system used in *The Sixty College Study*, a system which is being utilized increasingly in college financial reporting.[1] Contact was originally made with over seventy colleges for the detailed financial information described here.

Many of the schools were unable to provide us with such detail, while a few were reluctant to become involved. Our files now include reports from more than sixty colleges; we were able to complete our preliminary analysis of 31 of these. We are continuing to add to our sample.

After preliminary investigation, each school was sent a sometimes lengthy list of requests for further breakdowns, usually necessitated by the individualistic nature of each school's data. Much telephoning and in some cases personal visits at the institution were involved. The results are elaborated in this study; it must be noted that we have available considerably more detail than is presented here, particularly on salaries and administrative expenses.

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[1] Indeed, in some cases where we do not have data for all nine years studied, the cause was a change by the college in its presentation of financial information to this more standardized format, rendering previous data incomparable with data after the change was made.

Several recent studies and others in process which we have seen have used an aggregate or macro approach to compiling such data. That is, major cost category totals such as Instruction and General Administration have been taken from annual audits and analyses applied to these data.

We rejected such an approach in favor of a micro or building-block method. Various expenses within each cost area were scrutinized to build toward a total for each major cost component. In this manner (which is the more tedious method) we were able to spot and hopefully rectify major inconsistencies.

For example, a number of colleges treat their Student Health centers as self-sustaining operations within the Auxiliary Enterprises account. These centers may well be self-sustaining, but failure to place such expenses in the Student Services category and associated fees in Tuition and Fees can lead to quite incomparable results. Similarly, we found a wide variety of definitions for items placed in various Administration areas and the Instructional category.

As a result, in many cases the individual college may not easily recognize its own data. We are certain that we have made some errors in placement of data, but have spent many long hours trying to maintain consistency and comparability. We feel our approach has numerous advantages over the macro method.

Individual differences among colleges are too numerous to mention. Certain categories can be treated as more reliable than others; the various income components are treated in a fairly standardized manner by all schools, while on the expense side we found Library, Operation and Maintenance, Student Aid and Auxiliary Enterprises to be quite homogeneous. In this report we have tried to eliminate problems in definitions of Administrative categories by combining them into one Total Administration expense. (See attached table A for more complete definitions of each category).

We made several major changes which should be mentioned here. We defined our basic goal as arriving at a cost of educating the normal student population of the college; certain items not falling within this definition were netted out. For example, contract research is treated by many schools as a separately budgeted item, and a strong case can be made for its exclusion where it does appear. Institutions including this category in their operating accounts, and more heavily research-oriented colleges, might otherwise appear to have higher costs in terms of educating their student bodies than is actually the case, ignoring any carry-over educational value of such projects.

Similarly, and more obviously, such summer institutes as those held for high school teachers were netted out where they did appear; again, cost inflation would have resulted from their inclusion. Space does not permit a more detailed listing of the items netted out, but we have complete records for each college.

Another major change was in the allocation of staff benefits. Over half the colleges in our sample place staff benefits in one central collection account.[2] Following *The Sixty College Study* approach, we allocated these staff benefits to the various cost categories where the expenses were incurred. In some cases the colleges were able to provide us with such a breakdown; in others they were able to give us a rough percentage breakdown or relate staff benefits to salaries; in one other case we made our own best estimate as time did not permit a more exact breakdown.

While this may have led to some slight degree of error, we feel it to be a much stronger approach than we have seen in other research projects where this was not done, with the result that the General Institutional category (which included such staff benefits) was grossly overstated.

Other changes included the prorating of administrative expenses to Auxiliary Enterprises and the handling of aid to employee dependents. We did not prorate any amounts to Auxiliaries; doing so often led to the unrealistic situation where a college's administrative expenses increased in a given year, but due to an increase in the amount prorated, the net administrative expenses would decline. Also, as several schools were honestly willing to admit, there is far too often little thought devoted to methods of prorating, and more than half of our sample ignored it altogether.

The Sixty College Study suggests that scholarship aid to employee dependents belongs in the student aid budget. Although this is increasingly open to question, with many schools arguing logically that such aid represents a necessary staff benefit to attract qualified personnel, we have followed *The Sixty College Study* approach. However, in several of our tables and graphs, as indicated, we have netted out this amount when trying to get at the true student aid costs to the college of its student population.

TABLE A. *Income and expense categories*

- A. Income:
    - Tuition and Fees
    - Endowment
    - Gifts and Grants
    - Other income
  - Total Educational and General Income
    - Auxiliary Enterprises
    - Student Aid (Endowment and Gifts)
    - Intercollegiate Athletics
    - Other Income
  - Total Income
- B. Expenses:
    - General Administration
    - Student Services
    - Public Services and Information
    - General Institutional
    - Instructional
    - Library
    - Operation and Maintenance
    - Other Ed. & Gen. Expense
  - Total Educational and General Expense
    - Auxiliary Enterprises
    - Student Aid
    - Intercollegiate Athletics
    - Other Expenses
    - Total Expense

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[2] Or did; we have noted a trend toward more and more schools using *The Sixty College Study* approach in their financial reports, if they are not already doing so.

Definitions of Expense Categories:

General Administration.—all general executive and administrative offices that serve the institution as a whole.

Student Services.—services to the student body as a whole.

Public Services and Information.—costs of relations with the general public, alumni, and other institutions; fund raising costs.

General Institutional.—all remaining noninstructional current general expenditures of the college as a whole.

Instructional.—all current expenditures of the instructional departments; faculty salaries and fringe benefits.

Library.—expenditures for separately organized libraries.

Operation and Maintenance.—costs of maintaining the educational and administrative plant (not including auxiliary enterprises).

Educational and General Expenses.—current expenditures of all departments and activities of the institution that concern its educational program.

Auxiliary Enterprises.—all direct costs of normal income-earning auxiliary enterprises such as dormitories and food service.

Student Aid.—all expenditures for scholarships.

Athletics.—all expenditures for intercollegiate athletics.

Source: Adapted from *The Sixty College Study*, Appendix B.

TABLE B. *Colleges in the Sample*

Albion College	Albion, Michigan.
Allegheny College	Meadville, Pennsylvania.
Bowdoin College	Brunswick, Maine.
Carleton College	Northfield, Minnesota.
Claremont Men's College	Claremont, California.
Coe College	Cedar Rapids, Iowa.
Colorado College	Colorado Springs, Colorado.
Cornell College	Mount Vernon, Iowa.
Denison University	Granville, Ohio.
De Pauw University	Greencastle, Indiana.
Earlham College	Richmond, Indiana.
Furman University	Greenville, South Carolina.
Goucher College	Baltimore, Maryland.
Grinnell College	Grinnell, Iowa.
Hamilton College	Clinton, New York.
Heidelberg College	Tiffin, Ohio.
Kenyon College	Gambier, Ohio.
Knox College	Galesburg, Illinois.
Lawrence University	Appleton, Wisconsin.
Macalester College	St. Paul, Minnesota.
Monmouth College	Monmouth, Illinois.
Oberlin College	Oberlin, Ohio.
Ohio Wesleyan University	Delaware, Ohio.
Pomona College	Claremont, California.
University of Redlands	Redlands, California.
Rollins College	Winter Park, Florida.
Scripps College	Claremont, California.
St. Olaf College	Northfield, Minnesota.
Whitman College	Walla Walla, Washington.
Williams College	Williamstown, Massachusetts.
College of Wooster	Wooster, Ohio.

PART VI

FINANCING HIGHER EDUCATION IN THE 1970's

Section A

POTENTIALS FOR NON-FEDERAL HIGHER EDUCATION FINANCING

Financing Higher Education: An Overview

*Seymour E. Harris**

1. EXPENDITURE TRENDS[1]

My treatment is brief. Expenditures rise greatly in response to rising prices and enrollment, and also in response to the large relative increase of expensive education, e.g. graduate.[2] Thus, estimated graduate enrollment should expand 3+ times from 1958 to 1976, and 2+ times for undergraduates. Equally significant are the large relative gains of the expensive types of education, e.g. the sciences. But against this we should consider the relative growth of the Junior College, a low cost operation: enrollment in Junior Colleges is estimated to rise from 13 percent of total college and university population in 1956 to 22 percent in 1976.

One may draw the conclusion from the large increases in expenditures or income of IHE[3] in relation to GNP that the problems are not serious. Thus from 1890 to 1954 education and general income (higher education) rose at a rate 15 times that of national income. But two other statistical items raise some questions concerning the solvency of higher education.

Over the last 70–80 years, the quality of higher education as measured by the EGE[4] per enrollee in relation to per capita income has clearly lagged. But in the years 1950 to 1963 there has been some improvement.

Levels in 1963 as multiples of 1949–50 levels

I. Educational and general expenditures	4.35
National income	2.10
II. Educational and general expenditures per enrollee	2.70
Per capita income	1.65

Expenditures for higher education continue to rise more than national income. In this period of 13 years, expenditures per enrollee rose substantially more than per capita income.

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* The author is Professor of Economics, University of California, San Diego, Littauer Professor of Political Economy, Emeritus, Harvard University, and author of ten books on education and most recently: *Higher Education: Resources and Finance*, 1962. In accordance with the agreement with the Joint Economic Committee of Congress—Letter of November 29, 1968—I am dealing briefly with expenditures, causes of rising budgets and unmet needs, and more fully with sources of income, especially non-public income, and wastage.

[1] For my statistics, I depend especially on U.S. Office of Education, *Digest of Educational Statistics, 1968*, (referred to hereafter as D.E.S.) and *Projections of Educational Statistics, 1976–1977*, (referred to hereafter as *Projections*) 1968. Where other sources are used, I indicate them. I also frequently calculate from statistics from the two items noted above.

[2] From 1890 to 1959 graduate enrollment rose by 127 times, undergraduate 22 times.

[3] Institutions of Higher Education.

[4] Educational and General Expenditures.

The first part of the above table compares total expenditures of EGE (Education and General Expenditures) and national income. The former rises more than twice as much as the latter, which illustrates that growth in the quality of higher education lags relative to the Nation's economic growth.

A serious lag in the pay of faculty also suggests that higher education's inadequacies are much larger than the simple arithmetic implies. In the last 30, 40 and 100 years the pay of college teachers has risen only half as much as that of the working population.[5]

In service employments, prices tend to rise much more than in others because of productivity lags. The offset of rises in productivity against inflationary pressures is disappointing in education even as it is in medicine. We lack helpful indices of educational prices. But the above comparisons of educational costs per enrollee give an indication of price rises. Over a period of 13 years an increase in EGE per enrollee of 170 percent points to an 8-percent rise of prices per year compounded. This should be compared with a rise of 1⅞-percent compound increase over 13 years in the consumer price index.

Is the educational sector as highly inflationary and non-productive as seems implied by the difference of 8 and 1⅞ percent?[6] Obviously not. To some extent the differences may be associated with an improved quality of product: better trained teachers, extended library, a rising research product, improved plant, increased services to the community, etc.

The extent of the difference may be clarified by a comparison with medicine: the rise of medical prices over the years 1956 to 1966 was 42 percent; of consumer prices 19 percent; a rise of about 2⅕ times as great in medicine vis a vis consumer prices as compared to 4+ times in higher education in relation to consumer prices.[7]

In considering the rise of unit prices we should take into account the changes in the structure of higher education. The proportion of high and low cost IHE varies over a period of years and to that extent we are comparing non-identical items.

The expansion of services as an explanation of rising expenditures per student is confirmed by a study of Harvard's financial history, which I recently completed. Whereas early in the 20th century, salaries accounted for about 45 percent of expenditures, in more recent years they have fallen to about 25 per cent, the decline being offset by a corrsponding rise of wages. Whereas salaries are largely tied to teaching, research, and minimum administration, wages reflect the expansion of services provided by IHE and to some extent the improved bargaining strength of the workers.

Inflationary pressures are especially troublesome for IHE. In the study of Harvard's financial history, I found that in every period but one (the first quarter of the 19th century) every financial crisis came in periods of inflation. The rise of prices is matched only slowly by increases in tuition or gifts or rises of income on capital funds. Indeed, in recent years, increased investment in equities has taken some of the curse off inflation, but not enough. Management of our economy with minimum inflation would be a major government contribution to improving the financial condition of higher education.

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[5] S. E. Harris, *op. cit.*, pp. 639, 642–44.

[6] For the years 1966–67 to 1976–77 the rise per student is estimated at $1,600 or 53%. The corresponding compounded rise per year comes out to 4.35%.

[7] *A Report to the President on Medical Care Prices*, 1967, p. 14.

It will be recalled that the Carnegie Commission (Clark Kerr, Chairman), in its report on *Quality and Equality: New Levels of Federal Responsibility for Higher Education* (1968), proposed that total expenditures by IHE should rise from 17.2 to 41 billions from 1967–68 to 1976–77. The major proposals were to increase the Federal share of funds from $3.5 billion (21 per cent) to $13 billion (32 per cent) by 1976–77. Private contributions should roughly continue at more than one-half of total expenditures, and State and local governments should reduce their share from 27 to 17 percent but increase their contribution from $4.7 to 7 billion. This proposal is summarized in the following table:

Sources of funds expended by institutions of higher education

[Dollar amounts in billions]

	1957–58		1967–68		1976–77	
	Amount	Percent	Amount	Percent	Amount	Percent
State and local	$1.7	33	$4.7	27	$7	17
Private	2.8	54	9.0	52	21	51
Federal	.7	13	3.5	21	13	32
Total	5.2	100	17.2	100	41	100

The crucial issue is: Is the Federal Government prepared to increase its contribution by about $10 billion from 1967–68 to 1976–77. In *The Agenda for the Nation*,[8] [9] Charles L. Schultze estimates a fiscal dividend of $8 billion in 1971 and $38 billion by 1974. "The projected growth of Federal revenue over work load increases will reach about $70 billion by 1976–77" or 1/7th of the additional revenue. (Carnegie, pp. 12–13).

It may well be that the additional sums available to the Federal Government may be in excess of the $70 billion allowed in the Carnegie Commission Report. The excess may be related in part to the larger fiscal dividend by the year 1976–77 than by 1974. In 2½ years the fiscal dividend should rise by at least $25 billion or to $63 billion: $38+$25 billion=$63 billion. (Schultze's estimate for 1974 was $38 billion.) But the figure may be much larger.

[Billions of dollars]

Type of saving	Fiscal year 1971	Fiscal year 1974
Initial estimate of fiscal dividend by Schultze	8	38
Potential additional limitation on strategic forces and reevaluation of overseas commitments	2–4	10–15
Excess, receipts of social security [1]	2	6–7
Rigorous screening of existing programs to reduce or eliminate low priority items	1–2	2–4
Potential maximum dividend	13–16	56–64

[1] Allows for liberalization of benefits and adjustment to rising cost of living.

Source: *Agenda*, p. 47.

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[8] P. 19.

[9] See footnote 1 in *Agenda* volume table.

Undoubtedly all of these potential savings will not be made. but some part well may be. In addition, if the surtax is maintained, as is assumed likely now, there may be $15 billion more available per year at the high incomes of 1976–77. Even if ony ⅓ of the potential savings were made, ($7 billion) and if we add $25 billion for additional fiscal dividend for the excess in 1976–77 over 1974, and $15 billion for the continuance of the surtax, then the fiscal dividend would rise to $85 billion. I assume that no part of the fiscal dividend would be used to reduce taxes. Despite the assumed military savings of $25 billion in 1974 with the end of the Vietnam war, military outlays are estimated at $79, $91 and $100 billion in 1969, 1971, and 1974.

In discussing the costs of increased Federal contributions to higher education of $10 billion by 1976–77, it would be well to stress the point that the added cost comes out of rising income. From 1968 to 1976–77, GNP will rise an estimated $684 billion. *The additional $10 billion amounts to but 1½ percent of the expected rise of GNP.* The net gains to the economy associated with the output of college trained men and women will greatly exceed the added costs. Schultze has well said that with unchanged tax rates, "about one-fifth of that growth will be used for Federal programs, one-tenth for State and local spending and the remaining seven-tenths for private purposes." (*Agenda*, p. 48.)

In discussing the contributions of State and local government the Carnegie Commission Report (p. 7) stresses rightly the limited resources of these governments. The limitations are related to the heavy dependence on revenue from consumption and property taxes, largely inflexible sources of revenue. That these governments are confronted with inelastic sources of revenue is suggested also by their share of public welfare outlays. This is shown by the following table:

Percent of total national public assistance expenditures contributed by State and local government

	Percent
1928–29	79
1959–60	55
1968 (calendar)	39

Even though the percentage has decreased since 1928–29, the contribution of State and local governments continues to be large. From 1960 to 1968 their expenditures rose by 106 per cent as compared with 96 per cent for the Federal Government, despite their less productive revenue system.[10]

Under pressure of rising costs, private IHE are confronted with more serious obstacles to paying their bills than public IHE which have recourse to tax power. This may well result in pressure on state and local government to finance a larger share than proposed by the Carnegie Report. Thus one estimate of the percentage of enrollment in public IHE relative to total enrollment is as follows:

1900	39	1970	67
1930	49	1980	76
1950	52	1985	80
1960	58		

Source: S. G. Tickton in *Education and Public Policy*, S. E. Harris and A. Levensohn, Editors, 1965, p. 226.

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[10] Statistics from *Social Security Bulletin*, December, 1968, pp. 17–19, and *Economic Report of the President, 1969*, p. 305. (My Calculations).

2. UNMET NEEDS

I deal with these problems briefly. Their relevance here is to suggest that the resource shortage is greater than otherwise would be anticipated. Expenditures over the 6 years, 1970–71 to 1976–77, examined by the Carnegie Commission are estimated to rise by 77 percent, the increase of unit costs accounting for 34 percent and of enrollment, 27 percent. On the basis of past experience the increase of enrollment may be underestimated. Virtually all projections here and almost over the last generation at least have proved to be large underestimates.

In addition, we should take into account the inadequate provision for the low income groups. Even the well thought out and generous proposals of the Carnegie Commission may well be inadequate to aid the genuinely poor. A $750 grant to undergraduates may be adequate for the small liberal arts college but it would pay one-half or less of the costs in the high quality public IHE and one quarter or less of the top 50–100 independents IHE. Even with scholarships rising to $1,500 at major independent universities and colleges, the impoverished are scarcely touched.

One of the troublesome problems here is the inadequate provision made for the highly populated central core of the city.

The table that follows shows that the large metropolitan centers provide less space in relation to population for higher education than is available outside metropolitan areas and to smaller metropolitan areas. This is part of the ghetto problem and has contributed to demands from the Carnegie Commission and others for greater provision of space in the larger urban areas inclusive of ghettos.

Estimated higher education enrollment per 1,000 of total population in standard metropolitan statistical areas (SMSA): Fall 1965 [1]

SMSA size category	Population of universe [2] (thousands)	Enrollment [3]			Places per 1,000 population		
		Total [4]	Full time [5]	Full-time equivalent [6]		Full time	Full-time equivalent
3,000,000 or more	36, 598	746, 000	360, 000	454, 000	20. 4	9. 8	12. 4
1,000,000 to 3,000,000	35, 444	698, 500	437, 500	521, 667	19. 7	12. 3	14. 7
500,000 to 1,000,000	18, 804	577, 000	294, 000	371, 167	30. 7	15. 6	19. 4
250,000 to 500,000	17, 093	526, 000	391, 500	429, 833	30. 8	22. 9	25. 2
100,000 to 250,000	14, 150	821, 000	647, 000	696, 333	58. 0	45. 7	49. 2
50,000 to 100,000	2, 121	60, 000	47, 000	51, 000	28. 3	22. 2	24. 0
Outside SMSA's	68, 372	2, 312, 000	1, 850, 500	2, 004, 300	33. 8	27. 1	20. 3
Total United States	192, 562	5, 740, 500	4, 027, 500	4, 528, 300	29. 8	20. 9	23. 5

[1] Based on 20-percent sample of all institutions of higher education.

[2] 1965 estimates used where available; otherwise, based on 1960 census.

[3] Estimated based on sample.

[4] Includes full-time and part-time degree credit plus non-degree credit enrollment.

[5] Degree credit.

[6] Full-time equivalent degree credit enrollment; estimate based on assumption that 3 part-time equal 1 full-time student.

Source: U.S. Department of Health, Education, and Welfare, *An Analysis of Selected Federal Programs for Higher Education*, 1968.

3. SOURCES OF INCOME

The following table describes the sources of income for institutions of higher education in the three years 1909–10, 1939–40 and 1963–64.

Sources of income for institutions of higher education

[In thousands of dollars]

	1909–10	1939–40	1963–64
Educational and general	73, 041	575, 796	7, 830, 033
Tuition and fees	19, 426	201, 833	1, 899, 455
Endowment earnings	12, 681	71, 364	206, 214
Private gifts and grants	3, 551	40, 576	551, 507
Other	11, 367	44, 396	568, 088
Auxiliary	8, 966	144, 299	1, 610, 426
Plant—Fund receipts	19, 855	66, 306	2, 534, 182
Private gifts and grants	8, 379	22, 679	808, 583
Loans			
Other fund receipts			629, 605
Private gifts and grants	11, 156	36, 366	308, 693
Net increase in principle of funds			484, 111
Endowment funds			444, 811
Annuity funds			25, 350
Student loan funds			13, 944

Source: *Digest of Educational Statistics*, 1968, pp. 95–100.

Tuition in the 3 years under consideration accounted for 27, 35 and 24 per cent of educational and general expenditures. But to some extent the expenditures—e.g. research—should not be fully included as not being relevant for student costs of instruction. It may be said that students pay about one quarter of the costs of their education, though given the economic squeeze being felt by I.H.E., increasing pressure is being put upon students to pay an increasing share of costs. In fact there was a significant increase since 1949–50. A recent study puts the figure at 40 percent.

Is it possible that more tuition income could be forthcoming? Before tackling this problem, I should note that the gradual relative rise of enrollment in public IHL would tend to depress tuition income. In 1968–69, tuition at public institutions averaged $298; at private $1,436. Possibly pressure of taxpayers would raise tuition more in public than in private IHE. From 1958–59 to 1968–69, tuition in public IHL did rise by 52 percent against 42 percent for private. We can count on a $1,000 per student differential between public and private IHE tuition costs in the years ahead.

Another preliminary question is the contribution of the rise of enrollment against the increase of tuition charges in accounting for the rise of tuition income.

Additional tuition money will obviously come from additional enrollment. But such funds are not likely to improve the financial position of IHE so long as costs rise more than tuition income. Where unit costs greatly exceed tuition this is the likely outcome. Where there is much excess capacity, it is possible to increase enrollments and improve the financial position of IHE. But substantial excess capacity is not the rule.

Large rises of tuition may be possible if students were charged on the basis of income of parents. In California, for example, it has been shown that a large proportion of the families of students have incomes of $10,000 or more. For these families, assuming but one student at college at one time, the case for additional tuition fees is strong. Many institutions vary their charges in fact by offering scholarships according to the income, capital assets and needed expenditures of the family.

There is much to be said for increasing the tuition charge of the high income groups and using the proceeds to finance able students from impoverished families. The Reagan program in California was not unacceptable because a charge was being imposed, but rather because the additional receipts were to be used primarily for expenditures that should be financed by the State, and also to confer benefits on the taxpayer. Had Governor Reagan tied the additional tuition money to financing impoverished and able students, the opposition would have been greatly reduced.

Greater recourse to employment and loans is a road to increased tuition charges. In fact a strong case can be made for increased scholarships: X dollars of additional scholarship money yields NX of additional tuition money. For example, in 1949–50, student aid income was $16 million; in 1963–64, $151 million or almost 10 times as large. In the same period, tuition fees rose from $396 to $1,899 million.

1. Rise of Student Aid, $135 million.
2. Rise of Tuition, $1,503 million.
3. Line 2./Line 1. is 11.

In other words when confronted with financial problems, the college administrator can improve the college's financial situation by increasing tuition charges. But he is deterred insofar as the result is likely to be a serious change in the composition of his student body toward more affluent, but less able students. By offering additional scholarship money to those who might find it difficult to remain with additional tuition charges, the college can greatly increase revenue without seriously changing the makeup of the student body.

It is well to note at this point that the important subsidies to students are measured not by the $151 million of student aid but rather by the almost $6 billion difference between costs and tuition income. One unfortunate aspect of this larger subsidy is that it is made available to all entrants, irrespective of need. Scholarships to some extent reduce the costs of indiscriminate offer of this large subsidy. The scholarship money is offered in response to criteria of need and ability.

The contribution of scholarships can be greatly increased. Too frequently the grants are made irrespective of needs; issued in such small amounts that they do not make the different between entry and nonentry; issued at such high levels that money is wasted; tied to such limitations as family background, location of home, athletic prowess, and so on.

Perhaps tuition income could be increased if charges were tied to likely later incomes. To some extent this is done. Tuition is much lower in divinity schools (where the graduate may look forward to an income of $5,000) than in business and law (where the future income may average $15,000) or medical schools (where incomes currently are running at $35,000 a year for practitioners and in 50 years may well rise to $350,000). I say that these future incomes are relevant, but they are inadequately considered.

In recent years, the campaign for lifetime or at least 40 year loans with payment related to a percentage of lifetime or 40 year income has received increasing attention. This proposal's strength lies partly in the appeal of relating financing to likely income. This program not only may make possible entry to college dissociated from economic capacity to pay, and choice of college on the basis of interest, but also will make possible the financing of higher education over the period of receipt of income instead of over four years. If on the basis of past experience, family incomes rise by 10 times in 50 years, then as incomes rise the burden of financing a 40 year loan through X percent of income is greatly reduced.

The long term loan would have another great advantage, namely, that all students accepted by an IHE will be admitted and financed. It is a peculiarity of our institutions as compared to Western Europe where per capita incomes are less than half ours, that many students fail to get a college education because of financial difficulties, but in Europe, acceptance generally assures admission.

4. MORE PRIVATE FUNDS

It is clear from the Carnegie Report that in the coming years more funds will be required from private sources. In successive 10 year periods beginning in 1957–58, private sources may need to increase their contributions by $6 and $12 billion, but private sources would then by 1976–77 provide 51 percent or $21 billion.

It is not clear that the money will be had without the most strenuous efforts though the total of higher education funds needed by 1976 should not rise greatly in relation to the expected gains of GNP. In 10 years the bill for higher education would rise from 2 percent to 3 percent of GNP. The estimates of required funds by the Carnegie Commission vary greatly, however, from estimates by the Office of Education (O.E.).[11]

The Office of Education estimates the rise of enrollment in the 10 years ending 1976–77 at 58 per cent. On that basis (assuming no rise of unit costs), the $17.2 billion costs in 1967–68 would be inflated to $27.2 billion.[12] By dividing $27.2 into $41.0 billion. ($41 billion is estimated costs for 1976–77) we then get a rise of 51 per cent in unit costs, or 4¾ per cent compounded over 10 years. The Carnegie Commission total seems reasonable.

In the Carnegie Commission study, private sources account in each of the 3 years studied for somewhat more than 50 per cent of expenditures. It is helpful to compare the structure of income also. Unfortunately no statistical breakdown seems available beyond 1964. In this year private sources of educational and general income accounted for

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[11] But these differences are virtually eliminated if allowances are made in the Office of Education (O.E.) estimate for price rises, auxiliary and student aid, capital expenditures and several other items, e.g. higher enrollment in the Carnegie Commission estimate in response to more aid.

[12] O. E. *Projections . . . 1976–77*, p. 11.

46 percent of educational and general income, and about 40 percent of educational and general income plus capital funds:

Income	*1963–64 (millions)*
1. Educational and general	$7, 830
2. Relevant private sources	3, 593
3. Educational and general plus plant	10, 364
4. Relevant private sources	4, 067

Sources: *Digest Educational Statistics*, 1968, p. 95; *Projections of Educational Statistics to 1976–77*, pp. 77–78. My calculations. The breakdown between private and public is not always clear.

Another relevant search is for the break down of expenditures. The next table reveals that expenditures for education of students are about two-thirds of all current expenditures and that from 1957–58 to 1976–77 the share of education tended to decline.

Office of education estimates, current expenditures

[In billions]

	Total $ B.	Student education	Organized research	Related activities
1957–58	$4. 2	$3. 1	$0. 8	$0. 3
1967–68	12. 2	8. 4	3. 0	. 8
1976–77	20. 5	14. 2	4. 9	1. 4

Source: *Projections, 1976–1977*, pp. 86–87.

The capacity of the country to endure the large outlays envisioned by the Carnegie Commission Report depends largely on the income of the Nation and how increased funds are allocated. The allocation depends on the claims of competing services.

For some reasons we may be rather optimistic. Let us assume that in the next 10 years family income will rise by 5 per cent a year, assuming 2½ per cent inflation and 2½ per cent from rising productivity. These are conservative projections and assume good national economic management. Then starting with a family income of $8,000 in 1967–68, the family income and GNP would rise as follows:

	Income percent over that of 1967–68	Family income	GNP (billions) [1]
In 5 years (1972–73)	27. 6	$10, 208	1, 097
In 10 years (1977–78)	62. 9	13, 032	1, 401
In 25 years (1992–93)	339. 0	27, 088	2, 915
In 50 years (2017–78)	1, 147. 0	91, 760	9, 864

[1] Base, $860,000,000,000.

This table points to the potential rise of GNP and family income once we assume good economic management (e.g. 1961–68) and also exploit the compound interest law. This table is especially significant in that it underlines the relation of increased expenditures for higher education in the 10 years ending 1976–77 ($24 billion) to the rise of GNP of about $560 billion (24/560=4.4 percent.). As we proceed more and more into the future, the burden of current commitments is reduced in response to rising incomes. Insofar as we can rely on loan financing this massive rise of income contributes greatly to the financing of higher education currently.

5. POTENTIAL INCREASES OF TUITION

In 1959–60, tuition and fees provided about $1,160 million or one-fifth of current income. By 1965–66, they accounted for $2,765 million, a rise of 138%. Tuition amounted to 20 and 21½% of current income in these two years. It is possible to increase greatly the receipts from tuition and fees, though value judgments will be relevant in choosing tuition policies. Most college administrators dislike increases of tuition though private college spokesmen, who tend to cater to higher income groups and who receive less help from government than public I.H.E., are less hostile.

Higher education had indeed become a bargain—at the expense of the faculty who experienced a decline of real income even as the real income of the average worker rose by about 50%.

It is possible to support a rise of tuition on the grounds that in the last generation, tuition has risen much less than income per capita or family income. In the years 1940 to 1950, for example, I.H.E increased tuition by little more than one-third as much as per capita income. Higher education had indeed become a bargain—at the expense of the faculty who experienced a decline of real income even as the real income of the average worker rose by about 50 percent.

In 1940 tuition obtained by dividing tuition income by enrollment amounted to $135. If tuition had kept up with the increase of per capita disposable income in these years tuition would have been $214 additional by 1963–64 and $389 by 1968–69.

Hence tuition in 1968–69 related to rising capacity to pay as measured by per capita disposable income would be as follows:

Actual tuition, 1964 = $449.
Lag of tuition to 1969 = 389.
Total tuition = 4,860 billions.

But this figure excludes non-full time and non-degree students. The actual tuition in 1963–64 was $1.9 billion.

By 1978–79, tuition should rise by 63% over the 1968–69 figure. I assume 2% inflation and 3% rise of productivity per year.

Then tuition would be $1,343.
Enrollment 8½ million.[13]
Total tuition = $11.4 billion in 1978–79.

Should we allow for the tuition paid by part-time and non-degree students, the tuition potential would be about $13 billion. This total compares with actual tuition of $1,900 million in 1963–64 and $2,765 million estimated for 1965–66.

TABLE: TUITION, 3 YEARS, IN CONSTANT AND INFLATED DOLLARS

	1958–59	1968–69	1977–78
Constant dollars:			
Tuition	$438	$660	$863
Rise, %		51	30
Annual Rise, %		4½	2¾
Inflated dollars: Tuition, 2% yearly inflation, $		806	1,053

Source: O. E. *"Students and Buildings,"* 1968, pp. 95–97.

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[13] This figure is based on total full-time enrollment. I have deducted for the 25% on part time (average of one-third time) and roughly 5% not seeking baccalaureate or higher degrees.

Against the 63% rise,[14] based on 5% increase per year in current dollars over the years 1968 to 1978, might be compared the 4½ and 2¾% of increases in constant dollars estimated by the Office of Education in the accompanying table. We should compare the rise on the assumption of 2% inflation. Then tuition would rise by 84% from 1958 to 1968 ($438 to $806) and by 60% from 1968 to 1978 [15] ($660 to $1,053).

In assessing the burden of rising tuition one should allow for the more moderate rise of room and board, jointly, than tuition. Board rose only by 15% (public) and 18% (private) in the years 1958–59 to 1968–69.

Charges to students, 1958–59 and 1968–69

	Tuition, room and board	Tuition	Board	Room
1958–59:				
Public	$788	$190	$413	$156
Private	1,408	712	454	219
1968–69:				
Public	1,109	278	475	344
Private	2,331	1,313	534	404
Percent change:				
Public	41	46	15	120
Private	66	5	18	85

Source: *D.E.S., 1968*, p. 94. My calculations.

6. NET GAINS FROM TUITION POLICY

About $389 is added to the tuition bill to offset the lag in the rise of tuition in relation to the gains of per capita disposable income. It may be expedient to increase aid for one-half the students who might find the increase difficult to finance. By 1977–78, the cost of this additional aid would be $2 billion ($400×5 million). Hence the net gains in tuition income would amount to $13−$2 billion=$11 billion, or about $9 billion in excess of tuition income in 1963–64. If necessary, aid could be increased further—e.g., $3.6 billion as proposed by Dr. Kerr for 1976–77. Then there would be $1½–$2 billion additional available to finance rises in tuition related to other cost increases.

TRENDS

	Tuition	Enrollment (thousands)	Tuition income (millions)
1940	$135	1,494	$202
1964	449	4,234	1,900
1968–69	838	5,800	4,860
1978–79	1,343	10,000	11,415

Source: My calculations from *D.E.S., 1967*, projections to 1967–68: Economic Report of the President, 1969.

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[14] The actual rise is just a little less than 63%.

[15] I compare the constant dollar figure ($660 for 1969) with the estimate raised by 2% per year to cover inflation. The figure for 1978 would therefore be $1,053 rather than $863.

The totals for 1968–69 and 1978–79 should be raised by about 15% to include part time and non-degree students. Hence, the totals should be $5.5 and $13 billion.

Is this rise of tuition income excessive? By tying the increase of tuition charges to the gains of per capita disposable income, we suggest that the burden is not increased. In fact, with a rise of per capita disposable income of 733 percent from 1940 to 1977–78 (63 percent, or 5 percent compounded in the last 10 years) the burden of the rise of tuition is kept down.

RISE, NUMBER TIMES, TUITION AND PER CAPITA DISPOSABLE INCOME, IN RELATION TO PRECEDING YEARS

	Tuition	Per capita disposable income
1964/1940	3⅓ or 6 [1]	4
1968–69/1964	1⅓	1⅓
1977–78/1969	1.63	1.63

[1] The variations reflect effect of inclusion or not of past lags in tuition.

This burden may be reduced by allocating, as suggested above, $2 billion or more for student aid. The Carnegie Commission proposes Federal student aid of $1.91 billion by 1970–71 and $3.56 billion of aid for 1976–77.

As noted earlier, the availability of student aid facilitates the maximization of income for IHE. Thus from 1949–50 to 1963–64, the rise of student aid of $135 million was accompanied by a rise of tuition of $1,503 million or 11 times as much. I would not infer from this experience that a rise of Federal student aid of $1.9 and $3.56 billions would bring $21 and $39 billion respectively in tuition income by 1970–71 and 1976–77 [16] But I would argue that if public aid and private gifts, loans, etc. do not yield sufficient funds, a judicious combination of aid and rising tuition receipts, compounded of increased numbers and rise of tuition charges, would contribute towards acquisition of necessary resources.

Should the Federal Government provide this $3½ billion of student aid, as vigorously sought by the Carnegie Commission, then my proposed $2 billion of aid tied to a tuition policy related to rising income, may not be necessary.

In his able presentation William Bowen [17] finds that from 1962 to 1966, current educational expenditures per student for three major universities rose by $620; gross fee income by $404; and net fee income per student by $87. In other words, 78 percent of the increase in tuition charge is consumed in additional aid. Bowen explains that contributions of the Federal Government and foundations and the rise of graduate students, who are especially costly of aid, account for the small rise in net fee income. But I should stress the point that for all IHE over a period of 15 years I find that net figure [18] is not 22 percent but 90 percent (gross=$1,560; net=$1,350). The erosion of tuition as aid rises, even in the Bowen model, is not explained in large measure by drains on the general funds of IHE.

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[16] 1.9 and 3.56 times 11.

[17] W. G. Bowen, *The Economics of the Major Private Universities* (Carnegie), 1968, pp. 38–40. See also the paper by Willian Bowen in this collection.

It is at least possible that the tuition income by 1977–78 of $17½ billion or $15½ billion in excess of 1964 would provide more than the $12 billion additional in all sought from private sources by the Carnegie Commission.

7. THE RELEVANCE OF THE NATIONAL STUDENT BANK BY 1977–78

The possibilities of achieving this goal would be greatly strengthened by the support of a National Student Bank, which the Carnegie Commission has strongly endorsed. By making massive loans available, government and private enterprise can bring about financing of higher education by students over a period of 30–40 years instead of in 4 or 5, with a resultant reduction of burdens; can finance the loans out of income rising steadily and thus again cut burdens; and can make all IHE available to all students who can meet the entrance requirements. This is in contrast to Western Europe where, despite much lower per capita income, entry is not jeopardized by lack of finance by students. Ultimately such a program would be open to all students, not only to the needy.

A massive loan program raises all kinds of problems. How much? Where is the money to come from? Shall there be a subsidy with interest payments forgiven? Should the subsidy be available to the needy and the affluent? Even if we assume a loan of $1,000 a year for 4 years, which might at least cover tuition, and limit the loans to those in the bottom half income levels, we would need about $3 billion a year now, and allowing for the rise of tuition and numbers, at least $8 billion a year in 10 years, though these costs would be offset to some extent by repayments. It is not easy to discover the sources of even these rather modest requirements. The Carnegie Commission proposes loans of $2.5 billion in 1970–71 and $5 billion in 1976–77. In 1968, the Nation's savings were only $132 billion, with long-term interest rates as high as 7 percent. The interest rate charged would be crucial, and surely, in view of present conditions, even dumping a billion dollars of additional securities on the market would raise serious problems for the economy and the money market. Current agreements should surely take account of later refinancing at lower rates.

Large interest rate subsidies have brought abuses in the past and college loans do not have the security of house mortgages. A crucial problem is the charge for interest. "With an interest rate of 4 percent and payments up to age 67, the average annual payment for the entire alumni body would be about $200 per $1,000 of annual tuition for 4 years, without insurance . . . ." The annual cost of this program—allowing for the rise of income—would be 2 percent of income.

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[18] This gain is partly related to increased numbers.

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The extent to which time of loan and rate of interest determine the burden is suggested by the following:

Annual payments at 3 percent rate of interest for $4,000 loan in 4 years (10-year loan)	$491
5 percent	559
40 years:	
3 percent interest	181
5 percent interest	251

Source: O. Eckstein, *The Problem of Higher College Tuition*, in S. E. Harris, *Higher Education in the United States*, 1960, pp. 68–71.

Ultimately (by 1978) the amount of money needed would roughly be as follows:

5 million (½) of students.

$2,500 per student ($1,500 in 1968; $2,500 in 1978 as incomes rise by about ⅗).

Total need in 1978, $25 billion minus financing receipts.

The outlay of such a program could be kept down as private enterprise shares in the financing, and as greater use is made of the guaranteed loans which depress interest rates as has been done so effectively in the housing programs. If the program is to be effective, the protection of isolating resources through a corporation would be helpful. The cost to the government can be kept down if any subsidies in interest rates are limited to the needy and if more private enterprise shares in this program.

Even if the ideal program is not achievable, even a program starting at $500 million and rising to $5 billion in 10 years is not to be spurned. Repayments would further cut the net costs.

On the assumption of an average 40-year loan of $1,500 a year in the first 10 years, at 5 percent, with loans to half the students, then repayments should exceed $1 billion a year within 10 years and costs would be $375 per student. (Cf. Eckstein, op. cit., p. 68).

8. ENDOWMENT INCOME

In 1963–64, endowment income amounted to $266 million or 3–4 percent of educational and general income, and 14 percent of income from tuition and fees. The relative contribution of endowment to income has steadily declined.

Endowment, income, total and share of educational and general income (EGI various years

[Dollars in millions]

	Endowment income	Percent endowment income
1909–10	$12.7	17.0
1929–30	69.0	14.0
1959–60	207.0	4.4
1963–64	266.0	3.4

Source: My Calculation, *D.E.S., 1967*, p. 95.

Why has the contribution of endowment declined so much? One reason is the increase of prices and incomes in the economy. Endowment income responds to these rises only in part and with a lag though, since the early 1950's, IHE have treated the losses brought on by inflation by investing increasingly in equities.

A second relevant point is the increase of enrollment. As numbers rise, endowment income has to be allocated over a larger number and therefore the contribution of endowment per student declines. College Administrators often restrict numbers just because by increasing entries the contribution of endowment is reduced. A significant variable is endowment per student. Thus, in 1963, endowment per student in 37 private universities varied from $67,925 for Harvard to $826 for George Washington University; and for 58 private liberal arts colleges from $67,833 for Rice University to $2,924 for the University of Richmond.[19]

Still another reason why endowment income suffers is that gifts for current use become more important. In periods of stress a gift for current use provides much more income in the immediate future than income on endowment. Whereas gifts and grants were about twice endowment earnings in 1909–10, by 1963–64 they were about 4½ times as large.

All of this does not mean that endowment income is not of some importance. It is much more important for private than for public IHE and for some it is of great importance. At Harvard, endowment income accounted for about one-half of its income in the 19th century, and even in recent years they have accounted for about one-third of the income exclusive of government gifts and grants. Endowment income of all private universities dropped from 13.2 percent of education and general income in 1955–56 to 8.8 percent in 1963–64, and for Chicago, Princeton and Vanderbilt Universities from 43.5 percent in 1924–25 to 13.4 percent in 1965–66.[20] In the early 1900's, 180 IHE with more than $5 million of endowment (book value) owned 84 percent of all endowment funds. In 1962, 61 public universities obtained 4.1 percent of their basic expenditures from endowment income; and 55 private universities, 15 percent.[21] At the same time, of the 397 liberal arts colleges (private) with more than $500,000 of endowment, 58 had endowment income equal to 25 percent or more of their basic educational expenditures and 77 less than 5 percent.[22]

Endowment income is not going to increase its contribution, as tuition might, by 7 times or anywhere near that. We shall be fortunate indeed if endowment income stays at 3–4 percent of EGI. Such development would be an improvement over the last 30 years or so.

Here is what we can recommend. Treasurers should consider the possibility of allocating income on the basis of book rather than market values. Since rising prices and capital gains are the usual experience, the result of this accounting method, when applicable (it is not allowed in California and Pennsylvania, for example) would be that recent donors would gain an advantage over earlier ones. Older gifts would not profit from the rising market value as against book value. On the basis of book rather than market values, atomic physics would gain at the expense of paleonthology and classics (say). If this seems unfair, the reply is that, in later years, current gifts now favored would also lose to future donors.

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[19] D.E.S., 1967, pp. 74–75.

[20] W. G. Bowen, *The Economics of the Major Private Unniversities* (Carnegie), 1968, p. 35.

[21] O. E., *College and University Endowments*, pp. 4–5.

[22] *Ibid.*, p. 5.

> Of the 125 institutions with large endowments which reported that they pooled their funds for investment purposes, 60 per cent allocated their income on a market value basis. During periods of inflation and economic growth, when market values are likely to exceed book values, older funds receive relatively more income than newly donated money under the market value method, since unrealized capital gains are included in the formula of income distribution. In the case of a pool maintained on the basis of book value or the amount of original contribution, the advantage goes to the current donor during a rising market if the original cost of previously held funds is substantially less than their current market value . . .[23]

For unrestricted gifts, I should add, or a stable security market, the choice of accounting methods makes little difference.

In an earlier survey, 1958, it was shown that of institutions with endowments in excess of $4 million, 84 used the book value method of accounting and only 46 the market value. Only in the $50 million or more category did more than half (9 of 17) use the market value.[24]

How much more can endowments yield? Much will depend on how much new endowment funds will provide. Should endowment funds rise at 7 per cent a year as from 1949–50 to 1963–64, then endowment income would rise by 1.59 times in the years 1963–64 to 1977–78 or to $688 million by that year, on the assumption that yields continue unchanged.

A larger return could be had also if investment policies were improved. Endowment policy improved in the 1950's. Yet it is clear that policies were conservative. Thus from 1935 to 1958 the yield on common stocks averaged 2 percent in excess of bonds, and in addition the equity market moved up in a spectacular manner, but the IHE responded slowly. For example, in 1950 the Standard and Poor Index of Common Stocks was 18.40. In 1964, it was 81.54. This rise reflects an 11.2 per cent rate of return compounded annually over the 14-year period. With investments in 1950 with a ratio of debt equity at 60–40, the endowment would gain in value an average of 6.35 per cent yearly. (This is aside from the higher yields on equities.) Excessively cautious policies are suggested by the following: 1955–1964, the index of common stocks rose 100 per cent, but IHE maintained a ratio of 55 percent in common stocks throughout this period.[25]

In general, as endowment income has come to play a much reduced part in providing IHE with their resources, policies could easily change. When endowment earnings drop from 15 to 5 per cent of income, managers of these funds can more easily shift to equities. They can take more risks than if the contribution of endowment were much higher. Moreover, they also should be prepared to sacrifice principal to income in order to protect against inflation and hence achieve stable purchasing power.

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[23] O. E., *College and University Endowment: Status and Management*, 1965, pp. 54–55.
[24] O. E., *College and University Endowment Investments: A Survey*, 1958, p. 20.
[25] O. E., *College and University Endowment*, 1965, pp. 30, 40.

Greater recourse to use of capital gains also suggests a possibility of increased contributions by endowment income. Here investment managers tend to be overly-conservative. Many insist that the original gift plus any earnings are inviolate. A minority, however, would make available any surplus in dollar value over the original gift as not being an inviolate part of endowment. Those who view the gift as a security value do not feel free to allocate any part irrespective of appreciated dollar value.[26]

Incidentally, a policy of heavy concentration on growth stocks raises questions also. The college then sacrifices present income to future income. The current generation of students and faculty are to some extent being sacrificed in favor of later generations, a policy scarcely supportable in periods of financial stringency. All the more reason then for offsetting these losses by allocating at least realized capital gains now.

Still another approach to increasing the effectiveness, if not the dollar yield of endowment income, is to obtain increased proportions of unrestricted gifts. Tuition and annual giving are weapons to maximize unrestricted income. At Harvard unrestricted income seldom seems to rise above 20 per cent. The Office of Education study found unrestricted gifts at 37 per cent of the total.[27]

Another relevant consideration is the use to which gifts are made. The Office of Education finds that from 1958 to 1965 only 26 per cent of the gifts were used to increase endowments. The daily pressures of finance resulted in using new gifts primarily for current operating expenses, endowment, and plant and equipment in that order.

Whereas in 1920, 78 per cent of all gifts to higher education went to endowment, by 1940 the figure was only 36 per cent. From 1957 to about 1963, gifts designated as endowment averaged 13 per cent for public IHE and 28 per cent for private. Also striking is the relation of endowment to physical plant:[28]

[Dollars in millions]

	1950	1960	1964
1. Endowment	$2,647	$5,322	$6,954
2. Plant	$5,296	$14,653	$22,931
3. Percent (1÷2)	50	36	30

9. PRIVATE GIFTS AND GRANTS

How much more from Private Gifts and Grants? The table below gives some relevant facts.

[Dollars in millions]

	1909–10	1939–40	1963–64
1. Educational and general income (EGI)	$73.0	$575.8	$7,830.0
2. Private gifts and grants	$23.1	$99.6	$1,175.8
3. Percent (2÷1)	32	17	15

Source: *DES, 1968*, p. 95 (my calculations).

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[26] *Ibid.*, p. 55.

[27] *Ibid.*, p. 12.

[28] *D.E.S., 1968*, p. 95; *College and University Endowment*, p. 4. (My Calculations).

Provost William Bowen finds an increase of gifts and grants to 19 private IHE from $50 million in mid-1950's to $300 million in two recent years; and for 11 private institutions he finds a 6½ percent annual rise. My calculation for all IHE from 1939–40 to 1963–64 is an annual rise of 7 percent compounded over these 24 years. Should we apply the 7 per cent rise for the years 1963–64 to 1976–77, private gifts would rise from $1,175 million in 1963–64 to $3 billion in 1977–78.[29]

Perhaps a 7 per cent annual rise is overly-optimistic. Provost Bowen points to a slight declining trend—with increased competition among IHE for donated dollars, reduced interest of the Ford Foundation in helping higher education, as factors contributing to a reduced level of gifts—especially for the large private institutions which now appeal to less affluent families, with unfavorable effects on the volume of gifts. The public IHE also now offer much stronger competition. But the overall gains in gifts should do much better than gifts to private IHE.

In some important respects, the evidence is favorable to continued gains for private IHE. A favorable factor is the increased recourse to annual giving. Here the Ivy League has shown the way. Thus in a recent year Harvard obtained $2,627,801 from 21,643 contributions or about $120 per giver. Actually only one-fifth of the Harvard men participated.[30] With 11 million living college alumni, it would be possible to reach say half or 5 million with individual gifts averaging (say) $50. Then the total addition would be $250 million in annual giving, added to current gifts of about $1,500 million.

Another favorable factor is the rising level of income. Potential sources of gifts will rise more than the expected rise of family income of about two-thirds at these levels of income. In addition, population will rise by about 8 per cent from 1968 to 1975 and by 23 per cent by 1985.[31]

10. POTENTIALS: TUITION, ENDOWMENT AND GIFTS
(SOME CONCLUSIONS)

It is not likely that gifts and endowment income will rise by 7–8 times, as tuition might, even when constraints based on the increase of per capita income are invoked. But substantial rises are possible:

Increases:	*Millions*
Anticipated rises, 1963–64—1977–78 endowment income	$427
Private gifts and grants (3000—1175)	1,825
Annual giving	250
Total	2,502

The total gain could be $2.5 billion by 1977–78. Improvements in income from endowments and gifts are premised on the assumption of continued gains (as from 1950 to 1964) of 7 percent annual rise of endowment income and of gifts. Unfortunately the share of gifts going to endowment steadily declines even as the share to physical facilities rises. Larger diversions to endowment income and current operations could be had if the rise of the share of gifts to plant might be contained.

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[29] Cf. W. Bowen, *Op. Cit.*, pp. 42–47. My calculations.
[30] *40th Annual Report, The Harvard College Fund*, 1965–1966, p. 1.
[31] *Economic Report of the President*, 1969, p. 251.

William Bowen in his excellent study presents a strong case for smaller gains of income than are suggested here. But I note the importance of improved investment management, the possible gains of annual giving, the especially large response of gifts at incomes of the 1970's as incomes rise by 63 percent in the next 10 years (5 percent a year compounded), and the population rises about 2 percent a year, a factor making for increased capacity to cover additional gifts.

All of this is in addition to such crucial issues as the accounting methods used, a more audacious use of capital gains, and greater recourse to equity investments. The gains are partly in additional income and partly in more effective use of this money.

I have relied especially on the increase of tuition income to provide large additional resources from the private sector. Tuition should rise as charges respond to both rising per capita income and increases in enrollment. The successes in this area will be related to adequate aid programs.

My projections should not be taken to mean that I above all favor rising tuition charges. Rather, even if higher education succeeds in attracting the large amounts from the federal government, and more from state and local government though less relatively than currently—as suggested in the Carnegie Commission Report—large additional tuition will be needed, or we will face a serious drop in quality. If more can be squeezed out of government and other private sources, then we can depend less on tuition. For example, State governments without income taxes should introduce them and thus reduce tuition burdens. At any rate, any rise in tuition is limited by capacity to pay.

Howard R. Bowen, in a judicious presentation, offers a program that puts smaller burdens on students.[32] He would provide economical grants to students based on needs but in amounts geared to the likely willingness of the taxpayer to foot the bill. He would tolerate tuition differences between public and private institutions, and he would provide a loan program—not on the massive lines proposed above—but enough so that students who require more than the minimum to finance higher education can go to Princeton or MIT (say) if they are acceptable. Bowen would also have the government finance a substantial part of rising costs of each IHE. He would clearly depend less on tuition than I would.

11. WASTAGE

Any one who has been associated with universities or colleges for 50 years or more is aware of innumerable wastes. Any large operation tends to invite uneconomic operations. Here I shall summarize many of these costly procedures.

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[32] H. R. Bowen, *The Finance of Higher Education*, 1968. (Carnegie Commission on Higher Education).

A. COSTS OF FACULTY CONTROL

Faculties in higher education are very jealous of their rights to control the curriculum and even the budget. In their determination to administer, their primary responsibilities to teach and research suffer. A University operated by a faculty of 500 is likely to be a most uneconomic operation. What we get is a debating society, not an efficient operation.

A good example is the recent turmoil in California. The faculty was outraged because Eldridge Cleaver was not allowed to give a course for which he had few qualifications and many disabilities. They claimed that the Regents had absconded with their control of the curriculum. Not a word was said about the costs to the curriculum which accompanied the loss of taxpayer support because of many excesses by faculty. What was costly to the curriculum was this support. A faculty often takes over control of the budget by demanding curriculum changes which involve additional costs. But this may be wasteful given the resources of the institution.

B. FACULTY APPOINTMENTS

In order to achieve academic freedom, faculties have obtained the privilege of tenure under which a faculty member is protected in his job to age 65–70 unless he commits moral turpitude. In all my 46 years at Harvard I know of only two cases where a tenure member was fired. I know of many others who should have been fired. One sometimes wonders if the price of academic freedom is not excessive. (Abuses by extremist faculty may well bring losses to the faculty in this area.)

In conferring tenure appoints the IHE in fact commits a first class university to paying out more than $2 million over a 35-year period. A mistake may be very costly. Indeed, IHE are becoming increasingly aware of the risks involved and often require *ad hoc* committees to verify the wisdom of a tenure appointment, but many mistakes continue to be made. Even if mistakes are not made, the modification of our value system may involve institutions in losses. I recently heard of a major university offering a bright young mathematical economist $42,000 a year. The economist is clearly brilliant. But it may well be that 20 years from now the current fashion of mathematical economics may give way to other methodologies.

C. FACULTY PAY METHODS

In higher education as prices rise—and they generally do—the college has a choice of two adjustments: The first is to offer each faculty member a rise in pay in response to higher costs of living; the second is to allocate the additional funds on a merit basis. Few IHE have dared to adopt the second approach which seems to me the more supportable procedure. The attitude of most faculty is that to deny some members the cost of living adjustment is to deny them the full rights of tenure. The British have supported merit increases over all-over increases more than this country has.

Many IHE abandon salary scales. They bid, as above, for outstanding talent. The man who is promoted is the one who gets the offers. As Theodore Caplow showed in his *Academic Market-Place*,[33] smart faculty members learn how to get offers. But what I stress here is that the abandonment of scales—paying a new member $40,000, while no one else gets even $30,000, is costly in morale and in the long run is likely to yield a reduced product for a given outlay.

In determining wage policy, the IHE has to decide on what share should go to basic salary and what part to fringe benefits. This is a problem that has greatly interested me as I served on relevant committees both at Harvard and California. Yet there are few, indeed, administrations that examine possible fringe benefits in terms of costs, in terms of effect on morale, and in terms of what the faculty wants. Nor is the choice between spending x dollars on fringes or basic salary carefully examined. Fringe benefits are becoming an increasing share of total compensation and the institution should have a fringe as well as a basic salary policy.

It is not clear that most IHE have a genuine salary policy. Are salaries to be related to the cost of living, to average family income, to salaries paid by competitors, and/or incomes of other professions requiring a similar order of ability and training? What is the relation of salaries to years of service? How much should be provided for retirement years as compared to basic salary? Should the major increases occur in the early or later years? Should promotion be automatic from rank to rank—5 years as an instructor, 5 years as an assistant professor and then tenure? Or should tenure come after varying periods? And how much discretion should the Administration have at each rank—$18,000–$35,000 range for full professors or $25,000–$30,000?

D. OUTLAYS ON PLANT

Plant expenditures have tended to increase proportionately much more than outlays on personnel. The costs of allocations to plant are excessively large. Plant fund receipts, for example, were 11 percent of educational and general income in 1939–40, 29 percent in 1949–50 and 35 percent in 1964–65.

Whereas the proportion of gifts absorbed by endowment by IHE was 78 percent in 1920, by 1940 it had dropped to 36 percent, and by 1957 to 13 percent for public IHE and 28 percent for private institutions.[34]

It may well be that IHE are the victims of the donors' predilections, but more could be done to press for larger contributions for faculty and less for plant. When donors determine the use of funds, they tend to favor plant disproportionately.

Another factor that increases plant outlays is the increasing tendency of students to live in college dormitories, that is away from home. The net effect is bound to be a rise in the costs to the students, part of which will surely be borne by the institution.

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[33] Theodore Caplow and Reese J. McGee, *Academic Market-Place* ([illegible] [illegible]), 1958.

[34] *Digest of Educational Statistics, 1968*, p. 95, and Office of Education, *College and University Endowment*, 1965, p. 4. (My Calculations.)

A related problem is the waste involved in finding new IHE or professional schools not closely related to need. Clark Kerr has emphasized the need of more capacity in populated areas and especially in ghettos. As I noted earlier, the large metropolitan areas have much less capacity in relation to need than the small areas. Students within commuting distance go to college in twice the numbers relatively than those beyond commuting distance. In California in the 1950's, attendance varied from 57 percent in Napa County to 6.4 percent in Glenn County, with an overall figure of 41–43 percent. Uneconomic locations are part of the explanation. Again in Michigan in 27 counties with IHE, the percentage of college-age population in attendance was 32.9 percent; in 56 counties with no IHE, the attendance was 16.8 percent.

In the late 1950's, using the questionnaire method, I investigated the founding of 543 new IHL and professional schools over a period of 10 years. One could not be impressed by the reasons for choosing a particular site or for providing additional units. Many relevant considerations received little attention.[35] In some instances, founders refused to study need, or command of a market by competitors. Had they considered this point, no need would be shown.

E. Cost of Inflation

In virtually every period of financial trouble, the explanation in large part has been the impact of inflation. Perhaps college economists could do a better job of teaching us how to avoid inflation and also how to respond to it once it appears. In the post-W.W. II period, for example, at least until the early 1950's, per capita income rose several times as much as tuition. Going to college became a striking bargain. The colleges lost hundreds of millions of dollars by their reluctance to respond to the inflation. The faculty paid part of the bill as their pay lagged behind the cost of living and *a fortiori* behind rising per capita incomes. Throughout Harvard's 330 years, with very few exceptions, the adjustment of tuition to rising prices and incomes lagged seriously. Even today, as prices rise, the lag continues. There may be much to be said for a tuition policy which allows immediate adjustments of tuition to rising costs of living and even rising incomes. Many trade unions have achieved such an escalator clause. In view of the precarious state of higher education, automatic upward adjustments in tuition may be supported even if the effects on the economy may be slightly adverse.

In another area, IHE have reacted to inflation reasonably well. Yet there is something to be said for the statement by McGeorge Bundy that finance men in higher education have been too cautious. For example, in a recent period of 10 years (1955–64), common stocks doubled in price and yet despite this and very large increases in profits, the proportion of common stocks held were unchanged at 55 percent.[36] Surely, with endowment a small part of income now, the justification for increased risk taking is greatly increased.

Finance men in higher education have also been overly cautious in their handling of capital gains. They generally have failed to use capital gains to finance current operations, and hence their deficits have been larger and the resources for current operations smaller than they had to be.

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[35] S. E. Harris, *Higher Education: Resources and Finance,* 1962, Chapter 51.
[36] *College and University Endowments,* p. 30.

F. WASTES IN THE CURRICULUM

Proliferation of courses is one of the persistent diseases of higher education, the cost being increased outlays for instruction or excessive teaching loads for the faculty.

I have compared the number of courses for 12 outstanding Universities and Colleges: from 1901 to 1926–27 and to 1956–57, the rise was from 4,072 to 9,049 and 14,100 in the two later years.

The costs are high not only for the reasons stated above but also because of the unsettling effects and reduced integration of the curriculum. One expert wanted to know why one college with 1,117 students offers only 45 hours of English instruction and another with 916 students offers 113 hours.

The Commission on Financing Higher Education commented thus:

> The greatest extravagance in almost every type of institution from the smallest to the largest lies in the curriculum. This situation usually arises from the absence of even a broad general conception of purpose by which course offerings can be assessed. Partly to meet overrefined needs, partly to attract students, partly to meet competition, real or imagined, institutions have permitted their course offerings to grow more and more numerous, to proliferate far beyond real needs. Too many of our institutions have been victimized by the cult of coverage.
>
> . . . and many courses, once started, continue a life of their own until they become gnarled branches of the past, left unpruned while new branches of learning grow all around them.[37]

Anyone who has been involved in college administration or who has studied the history of higher education knows only too well that to drop a course is virtually impossible. Each faculty member gets protection for his empire with the implied promise that he will help his colleague to preserve his. At one point in the 1930's, President Conant of Harvard eliminated a whole department on the grounds that it was not a proper subject for college instruction. The reverberations are still with us.

One observer quoted Ray Lyman Wilbur who once said that it was harder to change a curriculum than to move a graveyard. This observer adds that it is more difficult to eliminate a course or a series of courses than to raise faculty salaries.[38]

G. THE STUDENT FACULTY RATIO (SFR)

Obviously, by increasing the SFR the authorities can reduce the costs of higher education. That does not mean that if the current ratio is 16–1 that increasing it to 32–1 would reduce costs by half. Faculty salaries are only part of total costs, but the savings could be substantial.

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[37] *Nature and Needs of Higher Education*, pp. 106–107.

[38] See S. E. Harris, *op. cit.*, pp. 522–26, 543.

Another reservation is necessary here. Against the financial gains one must consider the effect on the quality of teaching and the product turned out.

There are other obstacles to increasing the SFR. Part of the time of faculty goes to research and this limits the rise of SFR. Also, the savings are kept down in that the young and less costly faculty are likely to be replaced. In this connection, it is of interest that Caplow and McGee showed that according to respondents' reports, 33 per cent of the actual replacements made were necessary in terms of continuing the functions of a predecessor. The necessity of covering all or almost all fields is another check to large rises of the ratio. All these considerations suggest limitations on savings to be had. Nevertheless they may still be substantial. But the fact is that in the last 50–60 years, the ratio has tended to fall, despite the rising importance of research. Thus from 1902 to 1957, faculty increased 5 times, undergraduates 2½ times and graduates 4 times. Nevertheless in the future, if financial pressures continue, a rise in the SFR may be one way out to be considered seriously.

How does one get the SFR up? One approach is obviously to increase the number of students without a corresponding rise of faculty, or with a given enrollment to reduce the size of the faculty. We have already commented on this issue. Despite the proliferation of courses, however, the SFR has been dropping. Another relevant item is the size of classes. One way of increasing the SFR is to increase the size of classes. Why not have one class of 400 instead of 8 classes of 50? The savings in faculty would be large.

The theory that small classes are most effective has been exploded to a considerable extent. Hence it may with profit be possible to operate efficiently and economically by depending on (say) one class of 200 as against 8 of 25 each or 4 of 50. Ruml and others have shown that a combination of small seminars and large lectures by outstanding lecturers may be the wisest course. Above all, avoid the classes with (say) enrollment of 15–75, and one class of 400 may be preferable to 2 classes of 200 or 4 of 100.

Actually the size of the class may be a matter of secondary importance. Numerous studies have emphasized this point. That is to say, the more economical approach—large classes—may also be the most effective way to teach. The most thorough study ever made on the relative productivity of classes of different size was undertaken between 1924 and 1927 by Earl Hudelson of the University of Minnesota. He concluded as follows:

> In the light of all of the available evidence, size seems to be a relatively minor factor in educational efficiency measured in terms of student achievements . . .
>
> All these results suggest that the techniques of instruction may have less influence upon student achievement than is generally ascribed to it, that the value of student participating may be overrated.
>
> In 46 of the experiments (78 per cent) a more or less decided advantage accrued to the paired students in the large sections. Only in the remaining 13 or 22 per cent was there any advantage in favor of small classes.

Another approach to an increase in SFR is to increase teaching loads for the faculty (with enrollment unchanged). When teaching loads are too low, this could be a sustainable policy.[39]

H. PRODUCTIVITY

Let us define productivity as the excess of output over input. The number of graduates in *Who's Who*, the number of faculty in the Academy of Science are all relevant. But it is important also to consider the quality of the entering student.

On the issue of productivity, I cannot improve on several paragraphs from my recent book.[40]

> "Above all, productivity is an important problem for IHL. Over a period of fifty or sixty years unit (i.e., per resident student) costs have continued to increase even when corrected for the rise in price level—all the more surprising since the size of the average college has increased about six times during this period. Ordinarily with such a rise in numbers we would expect a lower cost per student. This may be explained by the reduction of teachers' work loads, higher real pay (over the whole period with interruptions), increased costs of laboratories, proliferation of courses, large increase in plant requiring substantial operating costs, and the increased services outside the classroom.
>
> "An industrialist may be particularly surprised that with this growth the cost per student has steadily risen. Even stranger to him, in a period when demand for the product doubles, the colleges are confronted with serious financial problems. What would appear as a boom to the businessman is in fact a threat. Colleges do not generally gain from rising enrollments, since they usually sell their product below cost. Under these circumstances, as their enrollments increase, their deficits rise. This generalization holds unless the increase in cost for the additional enrollment is less than the additional tuition revenue. In economic parlance, if marginal revenue exceeds marginal cost, the situation is improved; but if marginal revenue is less than marginal cost, the situation deteriorates. In public institutions, where tuition is generally a small part of average or marginal cost, a rise of enrollment inevitably means an increase in deficits or subsidies.
>
> "Why, it may be asked, in a period of fifty years when the average output per man rose about 2.2 per cent per year, has the real cost of higher education increased? The answer lies in part in factors mentioned above and in the difficulty of applying advances of technology to IHL. To some extent teaching is a personal matter: it is difficult to mass-produce it. Relevant also is the fact that colleges, and particularly their faculties, have resisted change and new methods of teaching. Some fear that the introduction of machinery may bring about technological unemployment. Many are determined to maintain old teaching methods at all costs. It is difficult for administrations to force change upon teachers who

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[39] I have discussed these issues in many parts of my *Higher Education: Resources and Finance*, and especially Chapter 44.

[40] *Higher Education: Resources and Finance*, 1962, pp. 74, 75, 550–58, 561–62.

are not employees, as industry can do when confronted with increased competition and falling prices.

"In some respects colleges face the same problem as other sellers of services. In the highly mechanized industries, unit costs tend to fall rapidly with the great developments of technology and management. The result is that these industries are able to pay much higher wages out of increased productivity. But other employments, not equally favored by these advances, must nevertheless meet the competition of the more productive employments for labor and materials. Colleges must pay higher prices for all that they purchase, even though these higher prices are not offset by corresponding gains in productivity. This is a most serious aspect of the economics of higher education.

"Any economist who raises the issue of productivity or economies is likely to be met with the criticism that he stresses problems of finance more than those of education. He is also likely to be told—and the author has been confronted with this charge by a number of college presidents—that he is undermining the programs for raising funds for IHL. It is held that a businessman who hears from an academic man that colleges operate inefficiently will refuse to open his pocketbook. Yet the only answer can be that in these problems, as in others, the academician must seek truth where he finds it. Many college presidents have complained of inefficiencies in administration and serious wastes—some are quoted in this book. They can also contend that inefficiences prevail in all large enterprises—business, governments, educational institutions. Their defense is important also. The peculiar form of government of IHL, related in turn to problems of tenure and academic freedom, tends to reduce the productivity of IHL. Without tenure, it might well be somewhat more difficult for this writer to discuss these issues as he sees them. College administrators should not, of course, blame faculty for all inefficiencies—administrators, politicians, bureaucrats share the blame. But it is my considered opinion that the largest responsibility rests on faculty, generally most reluctant to cut down on wastes and modify curricula, teaching hours, and teaching methods.

"In my questionnaire to hundreds of economists likely to be knowledgeable in this field, I found a widespread grasp of the economic problems of higher education. They are aware of the costs of excessive courses and small classes; of wasteful use of plant; of the heavy costs involved in teaching poor students; and of the relation of reform to their own economic status. They are also aware of the blocks placed by faculty in the way of needed advances in curriculum—a point treated eloquently by Corson in the book mentioned earlier. Many of these economists want both more lectures and more small groups to teach; they frequently propose large classes for average or below-average students, and possibly for most in the first two years, but they seek greater personal contact for the able students. Many also want greater use of visual aids, though a minority are skeptical. Though most of these few hundred economists seek a more efficient operation, they also are aware of the danger of treating a college like a business. Do not allow the efficiency expert to take over!" is a frequent warning.

"The academic vice president of Tulane University, Fred Cole, estimates that twelve-month operation would provide for 50 to 75 per cent additional students without a significant rise of capacity. Another expert found that a year-round schedule for the nation's IHE would increase degrees by 56 per cent a year, provide 30 per cent more instructional facilities, and make possible a 30 per cent rise of faculty salaries. At the University of Pennsylvania, a modernization of curriculum and facilities increased the capacity for engineering students by 50 per cent. Through a lengthening of the school year and reduction of duplication—e.g., largely concentrating chemistry in the medical schools—the Johns Hopkins Medical School expects to save the student two years, and of course utilize the capacity much more effectively. Western Reserve University has also experimented in its medical school to avoid duplication, increase independent work, and further integration of staff and materials. At Kenyon College it was estimated that an increased use of capacity by increasing enrollment by 80 would reduce the average deficit over several years from $56,000 to $23,000 to $32,000. A widespread practice of upgrading teachers colleges to liberal arts or even to complex colleges also increases capacity. Though in 1921 only 42 per cent of the 165 accredited degree-granting teachers colleges operated at the baccalaureate level, by 1959 only 38 per cent of 180 institutions primarily prepared teachers.

"In a paper before the Conference on Moral Standards in September, 1953, President Hancher of Iowa University, one of the leading educators in the country, had some profound things to say about these issues. One question raised by President Hancher is:

> What educational program is the institution qualified to offer? The question, carefully considered, calls for an accurate, honest, complete appraisal of the institution—its staff, its facilities, its finances, its complete resources—to determine whether or not it possesses the competence and quality essential for the conduct of the program or programs which it offers. It is designed to bring institutions back to a functional integrity which is sadly lacking in our system.

President Hancher complains, "Few institutions hesitate to rush into new and presumably popular programs which they were not organized to offer, for which they possess no special competence, and for which the demand has been created by them rather than by the public. . . ." Institutions without the requisite scientists or resources should not apply for government research contracts in order to attract staff and acquire facilities. Unrestrained and unintelligent competition reduces standards, and low standards tend to drive out high ones. Another waste that President Hancher refers to is that of recruiting new students. He is all for expensive recruiting in order to save the able students who are now left out. What concerns him is that the institution ". . . actively intervenes to affect the choice of the prospective student on grounds other than the true educational worth and attractiveness of the institution." He wants to know whether the information given is fair and accurate. Are students recruited who in their own best interests should go elsewhere? Apparently there are even solicitors who receive a commission or bonus on the basis of students signed up and matriculated. The expenditure of funds for the diversion of students from one institution to another cannot largely be justified."

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"Faculties are disposed to expand courses, and commitments generally, without adequate consideration of the costs. Trustees seek to restrain faculties in their quest for empire building. In between are the president and his immediate assistants whose function it is to reconcile the faculty's emphasis on educational values and the trustees' emphasis on finance.

"In general, the decisions are likely to revolve around how additional resources should be spent. Neither trustees nor faculty, nor administration, tend to examine the allocation of funds in the existing budget. Once $250,000 is allocated to paleontology, or $1 million to intercollegiate athletics, these outlays are sacred, and no cut is likely except in the midst of a great depression. Even budget officers of state governments tend to accept past budgets and only raise questions concerning additional funds requested. In a conference of Western states, the point was made that budgetary procedure is unsatisfactory, because no genuine attempt is made to examine existing budgets to discover the possibilities of cuts on past budgets.

"It is not even clear that the allocation of additional funds is generally the optimum. Having apprised themselves of the objectives, the authorities then may have to decide how to spend an additional million dollars of income (say) expected per year in the next few years. Unless a capital outlay is selected, they can be reasonably certain they are assuming a relatively fixed and recurring charge. Then they have to decide whether the million dollars is to be put into one project, say general education, or a three-year capital budget to renovate classrooms or build new dormitories, or whether the funds are to be allocated over several enterprises with the objective of allocating dollars where they yield the largest returns. Without a profit measure, the returns unfortunately are not easily measured. Will $1 million yielding $50,000 a year provide a larger product if invested in three first-class lecturers in English or in five good tutors—on the assumption that English instruction needs to be improved—or in a chemical laboratory, an area in which the college is already distinguished? The president or dean is subject to all kinds of pressures for expansion or improvement of quality, and in preparing his budget he necessarily weighs one project against another. He will also have to set up priorities and to estimate costs of alternative paths toward achieving a particular objective.

"Among the issues that should be studied with great care are the ratio of students to faculty and the improved use of physical facilities. There is nothing sacred about the ratio of fourteen students to one member of the faculty. This ratio can be changed by reducing the number of courses or by alternating them, thereby making it possible to increase the size of classes. Nor has study after study shown that there is anything sacred about a section of 25: they have shown that a lecture to 100 by a good lecturer can produce much better results than four sections of 25. Indeed very small groups, say, tutorial groups, may be a very effective form of instruction, though expensive. Such groups do stimulate students to think, to write, to stand up in argument, offering them an opportunity to confront difficult problems. But the idea that teaching a class of several hundred is not effective when properly done has not been supported by numerous controlled experiments. In other words, there is much folklore in the matter of the size of classes, as well as in the number of classes. Though he oversimplifies the problem, there is much truth in Ruml's suggestion that the way to get salaries up is to double the size of classes and reduce the total number of classes.

"Another trend in higher education has been the tendency to introduce a larger proportion of what might be called nonessential elements of higher education into the educational product. In other words, a "college education" contains less of what we generally refer to as education and contains much more of the joint product—medicine, employment aid, college athletics, dormitory facilities, food, recreational facilities, and the like. The result is a much higher cost for education than would otherwise be necessary. For many institutions and families this does not involve a great burden and makes education more appealing and perhaps more effective. But as costs rise and financial problems become more serious, we should become more conscious of these mixed elements in our educational bill of fare. With the development of the junior college and the tendency for enrollment to rise in the large metropolitan areas where the population tends to grow, the importance of these additional services is likely to decline and to that extent the financial problems will become less serious."

I. Deficiencies of Admission Polices

It is a striking fact that only about one-half of those who enter IHE ever graduate. For students who go to Junior Colleges the attrition is much greater. Hence strong voices are being heard on the inadequacies of admission policy. One expert suggests the following changes:[41]

1. A return to more rigid curriculum requirements—a means of eliminating those without adequate preparation;
2. An end to early admission and rolling admissions;
3. Widespread adoption of preliminary screening of applications—involving double decision making on many applicants;
4. Mechanistic control of the college admission process—requiring a clearing-house approach;
5. Earlier and earlier communication, with earlier decisions.

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[41] G. H. Hanford, "Free Enterprise in College Admissions," *College Board Review*, Winter, 1959, pp. 8–11. The abuses in admission policy are well put in the statement by Professor Hancher.

President Newsom of New York University wants to know why some college students with an I.Q. of less than 110 have great difficulties with college work; why, in 11 New York institutions, 45 percent of entering students with I.Q.s less than 110 intended to take 4-year college courses. A survey of 1957 showed that one-third of those interested in higher education had an I.Q. of less than 110.[42]

J. Independent Work and Assistants

Independent work by students saves resources and improves the educational product. A greater use of assistants is also saving of resources and contributes to the training of teachers. But these institutions can be abused. Let me quote three paragraphs from my book.[43]

> "A word should be added on the problems of independent work and assistants. All kinds of attempts have been made to stress independent work, that is, focusing on learning as against teaching. In some kinds of independent work, e.g. honors work, the cost of instruction per student may be increased rather than reduced. From numerous experiments it is concluded that independend work will prove a failure unless preparation is made for it, that it tends to be more productive if started in the freshman year and continued throughout. On the whole, putting a student on his own for a whole semester without any preparation or guidance is likely to be disastrous. Reducing classes from three to two per week or putting aside a few weeks each semester (the Harvard reading period) for independent work seems to bring better results than a long spell of independent work. Yet the largest economies are to be had by sending the student away for one quarter, thus through a four-quarter system doubling the capacity of the plant (the Oberlin plan). Careful preparation and guidance (e.g., abroad) may yield a successful quarter-away plan.
>
> "In my experience as a tutor for forty years I found this work rewarding and most productive for the students' development, though very costly to the tutor. Presently I am giving a seminar to 10 freshmen on public policy. Each student meets with me and a colleague at lunch once weekly and ultimately writes two papers based on source materials. This is one of my most satisfying teaching experiences in over forty years of teaching, but it is not saving of time or resources.
>
> "Use of assistants may be very productive. It is uneconomic for a $20,000, or even a $10,000, faculty member to grade papers, take attendance, go over readings with students, or supervise laboratory work. The large universities tend to utilize graduate students effectively for this purpose. I once estimated that 15 to 20 percent of the classroom hours at Harvard (arts and science) is done by teaching fellows (graduate students), generally with two years of graduate work behind them. Where graduate students are not available, good results can be obtained with undergraduates if the position is given prestige and their contribution is well integrated—as the Williams experience showed."

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[42] See *The New York University Self-Study: Final Report*, 1956, p. 18.
[43] *Op. cit.*, pp. 544–45.

K. COVERAGE OF OUTLAYS ON ORGANIZED RESEARCH

By 1966, IHE expended $2,830 million on research and development. For years, the management of IHE have complained of the burdens put upon their institutions because the Federal Government pays only part of the overhead involved. As long ago as 1955, President Furnas noted that of $500 million made available for organized research, the IHE contributes $95 million of their own funds. He pointed out that even the Armed Services pay out but 63 percent of direct salaries as wages instead of actual costs of 82 percent. The NHS paid only 15 percent of salaries to cover overhead as compared to actual costs of 50 percent. They do not seem to have been treated as well as industry. With 4 billions of expenditures for organized research estimated as needed by 1976–77 by the Carnegie Commission, adequate financing for overhead should make a difference of a few hundred millions.[44]

12. SUGGESTIONS FOR INCREASING PRODUCTIVITY, CUTTING COSTS AND RAISING REVENUE

A. COSTS AND ABSENCE OF MARKET GUIDES

In the preceding discussion, I have pointed to deficiencies in management. I have also quoted the views of outstanding college administrators on the failures in administration. These points are documented at length in my *Higher Education: Resources and Finance.*

But one should not go too far in this direction. The large business corporations also duplicate services and indulge in other wasteful practices. Faculty determination to participate in, if not control, management; the impact of academic freedom and tenure; the unavailability of the market test for non-profit organizations—all of these necessarily contribute to the high costs and low productivity. The blame lies more on the system than on the men who operate it.

In the preceding discussion, I have adumbrated at possible improvements. Perhaps one of the most important attacks is a greater interest in costs. Anyone who raises the issue of costs at a faculty meeting is likely to be silenced by those who insist what matters is educational policy, not the dollar sign. But just because the tests of the market are not available, it is not unimportant to scrutinize costs.

Unfortunately, discovering costs in higher education is replete with difficulties. A faculty member teaches undergraduates and graduates, participates in administration and research and provides services to the public or government. The product is joint. It is not easy then to discover the cost of a course (say) in faculty time and dollars. But increasingly the authorities examine costs. Business is also confronted with problems of joint costs. They do not, therefore, give up the hunt for costs. Oddly enough the best studies of costs have come from medical schools.[45]

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[44] See G. F. Baughman, Formula for Determining Indirect Cost in Research, *College and University Business,* March, 1961, pp. 32–34; *Bureau of the Budget Circular No. A 21, Revised, January 7, 1967;* and Various Recommendations in Circular A–21.

[45] S. E. Harris, *op. cit.,* pp. 502–03.

> "Cost analysis, no matter what system is used, is not an exact science, but rather like medicine, an art based upon a science. It is an art in the same sense that judgment is an important part of the process. Judgment must be used in such matters as determining how to distribute each overhead cost most equitably and develop the best estimates for the distribution of personnel time, determining where the exceptions to the established rules are justified, or perhaps in considering the relationship of the purpose of an expenditure to the method of distribution. Obviously, these judgments must be based upon a familiarity with the general philosophy of the enterprise under study. These judgments should be supported by reason, and reason, of course, is frequently debatable."

A Northwestern University study concluded:

> "Educational administrators have been chosen largely from the field of scholars and they have not been trained in the economic understanding of their assignments. The correlation of the myriad activities in an institution must be doubly watched when a change of educational authority is in process. Scholars rarely approach an administrative appointment in education with an understanding of the intricacies of fund accounting, educational costs, budget control, centralized purchasing, and investment management. As a result, good business management is evident in successful institutions and weak business management have foredoomed many colleges to extinction. It is a rigorous assignment, for men in these business positions are supposed to be wise enough in education to win the confidence of the educator and sufficiently proficient in executive management to meet the test of trustees who are successful in business management."

One must be careful not to put too much into cost studies. The high cost course may be a more valuable experience and despite the high costs may be a justifiable part of the curriculum against another course with costs half as large per student. There is the danger of allocating X dollars per student to each institution in a state, thus bringing them all to an equally mediocre level.

B. IMPROVEMENTS BASED ON EARLIER DISCUSSIONS

Our earlier discussion points to numerous measures that may be helpful: less interference by faculty in administration and especially in financial control which is reserved for governing boards; professional help for investment policies, especially for the smaller institutions, and greater exploitation of equity markets; increased recourse to student aid as a means of providing many times as much tuition without changing the structure of the student body in favor of the more affluent and less able; greater recourse to annual giving; bringing down costs to students by economizing on auxiliary services, the cost of which in 10 years may rise to $5 billion a year: more caution in seeking and accepting endowed chairs . . . a chair that cost $20,000 one hundred twenty-five years ago now needs $600,000 to finance it and in 50 years may require $5–$6 million.

C. Cooperation

Large savings are possible with increased cooperation of between institutions. In recent years, a number of cooperative ventures have been introduced. Among the interesting experiments at cutting down duplication and increasing cooperation have been the 10 colleges included in the Associated College of the Midwest, and the new college in the Berkshires, leaning on the resources of 4 neighboring colleges. In the library area especially is cooperation necessary. From 1959–60 to 1965–66, the number of volumes in libraries of colleges and universities increased from 176,000,000 to 265,000,000, or about 50 percent in 6 years. The increase of operating expenditures was from $137 million to $320 million. It is not surprising then that some large libraries are cooperating by dividing responsibilities among libraries by fields, thus cutting down purchasing costs.

Cooperation could go much further. A comparison of the 10 States with highest expenditures per member of the college age population and the 10 with the lowest expenditures is revealing. Of the 10 with the largest outlays, Arizona, Colorado, Montana, Nevada, North Dakota, and Utah are included. These 6 States are small States. They averaged less than one million population in 1967. Thus costs are high because for many educational functions the States are too small to operate efficiently. To some extent, the Rocky Mountain States have dealt with this problem. For example, they have cooperated in the medical education field.

Compacts along these lines are now found in the South and New England also. The 16 Southern States, for example, concerned over rising costs, arranged for students in professional schools to move to areas of excess capacity from schools where space is inadequate. The Board "was to serve as a clearinghouse for information about higher education . . . provide continuous assessment of the needs of higher education in the region and make plans to meet them. . . ."[46]

D. Planning

In my discussion of the problem of location of new IHE I was critical of the lack of sensible planning. To give but one example here. In Massachusetts, Metropolitan Boston, with half the State's population, includes 6 of its 7 law schools, all 3 of its medical schools, both its dental schools, and 9 of its 13 graduate schools.

In Massachusetts, the ratio of enrollment to population varies from 4.5 (Hampshire County with 4 substantial IHE) to 2.7 (Suffolk, the Boston area) and 0.2 for Essex and Plymouth. The index for New York City is 2.9; for Baltimore only 0.9.

In general, the poor States seem to have an excess of law schools which often operate at 50–60 percent of capacity though in rich States 80–85 percent of capacity may be used. Ph.D. programs are costly and therefore increased costs of travel may be the way out. Medical Schools in places with population of less than two millions may be unwise.

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[46] S. E. Harris, *op. cit.*, pp. 352, 597

In some States, e.g. California, a coordinating board contributes to improved allocation of funds and facilities. But in many states, provision of additional space is not closely related to needs. Overall planning is far from adequate. It is necessary to consider the overall objectives of an institution, the integration of finance and educational objectives, and the relation of the institution to the complex of higher education.

Heneman, a partner in the firm of Cresap, McCormick and Paget, raises some interesting problems of planning.[47] This particular firm has done a great deal of work of an advisory nature for colleges and universities. Heneman says that colleges should be able to assure potential donors (1) that the objectives of the institution have been examined realistically, (2) that the curriculum has been tailored to serve these objectives and the faculty is being used effectively, (3) that proliferation of course offerings which add substantially to instructional expense is being curbed, (4) that over-all enrollment objectives have been fixed, (5) that enrollments by school and college are projected for each year to 1970 with provision for annual revisions, (6) that the intensity of use of present classrooms and laboratories is known as a result of a study of student station (i.e., seats) utilization, (7) that new building needs have been determined on the basis of equating present and later use of existing facilities with enrollment projections, (8) that priorities on new buildings have been established both on the basis of kind and date when buildings will be available, (9) that requirements for capital funds have been made on the basis of these estimates of building and enrollment, (10) that operating-fund requirements have been projected, (11) that projections of income have been made in order to determine various financial arrangements, and (12) that present funds are being used effectively.

With limited resources, the college may restrict enrollment, introduce economies or deteriorate its product. As I have stated in my recent book:

> "Resources are limited, and no college administrator can be allowed to forget this. The prestige colleges are inclined to stress the need of turning out a first-class student. Hence, with limited resources, they tend to restrict enrollment and generally refuse to assume responsibility for contributing toward finding space for the increased student body of the next 10 to 20 years. Where a first-class institution incurs a deficit of (say) $1,500 per additional student on operating expenses and would require approximately $1,000 to $1,500 per additional student for housing and academic plant, and would have to spread endowment over a larger number of students and hence the endowment contribution per student would be reduced by (say) one-quarter, the governing board may refrain from accepting more students. That would clearly be its position unless the authorities can raise large additional resources, or introduce substantial economies—e.g., large classes, improved use of plant—or if they are prepared to accept some cut in quality in exchange for large numbers. A product rated at 100 may, for example, be deteriorated to 90 with a rise of enrollment of 25 per

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[47] H. J. Heneman, "Planning Comes First: Fund Raising Follows," *College and University Business*, 1958, pp. 23–24.

cent. Is the contribution of the college less if the quality of product is reduced by 10 per cent and its numbers raised by 25 per cent?

"A college confronted with issues of this kind, unable to obtain additional resources from government or philanthropy, might conceivably increase its tuition substantially. But this raises serious problems, discussed elsewhere. A private IHL may then, as suggested above, restrict numbers. A public IHL might also restrict numbers, but there are political difficulties here, unless alternative institutions are provided. On the assumption of inadequate resources and continued rise of demand, the way out for the public IHL may well be a general deterioration of the product. But preferable would be two differentiated products, as suggested above—one for the top 25 per cent and the other for the remaining 75 per cent."

E. Optimum Size

"It is generally known that costs per unit vary with size. In general the larger the size, the smaller the unit cost; but this is likely to be true only up to a certain level.

"A 1957 study of California higher education raised some relevant problems.

> "With no attempt at this time to specify optimum sizes for particular departments, colleges or schools, it may safely be assumed that a minimum of 2,000 students is sufficient to operate an undergraduate program of university calibre, serving primarily to prepare students for graduate work and professional training.

"In an earlier study, the experts opposed a college enrolling more than 5,000. Enlargements of administration, plant, etc., are likely to be so costly that one may as well start a new unit. By 1960, the master plan in California supported optimum enrollments in state colleges of 8,000 to 10,000 and a maximum of 12,000 to 20,000.[48]

> "It may further be assumed that enrollment of 10,000 full-time students is sufficient for a campus with full-scale university functions, including those of unlimited graduate research in education toward professions (characteristic function which the university emphasizes). On the other hand, it can be assumed that a full-time enrollment on a single existing campus of the University of California that substantially exceeds 25,000 students would tax campus facilities to a point of requiring expansion of a magnitude equal to that of establishing a new campus.

"In support of this assumption, a study committee composed of faculty members of various campuses of the university pointed out:

> . . . that there are important qualifications as to the number of courses that may be dropped from a university curriculum;

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[48] California State Department of Education, *The Study of the Need for Additional Centers of Public Higher Education in California*, 1957, pp. 83–84; *ibid., A Report of a Survey of the Needs of California in Higher Education*, 1948, p. 19; and *ibid., A Master Plan for Higher Education in California*, 1960–75, p. 13.

> that there are limits to the expansion of class sizes and room utilization; that growth in size can result in growth in complexity to the extent that the proper functioning of a campus is hampered; that in time physical limitations become crucial; and that 'when a campus grows beyond a certain point, sheer size produces a number of psychological problems,' which it is suggested affect the 'process of educational and social growth.' Further regarding this assumption, it is observable that expansion to provide for enrollment of more than half again the present number of students will almost surely require substantially more ground for additional buildings and necessary facilities."

In the late 1950's Marlboro College in Vermont had 40 students. I was assured that once enrollment rose to 100 the college would be in the black. But the toll on educational product for such a small IHE is great. The curriculum is seriously limited and even a larger college, and a good one, Bard, had to offer some courses only once in 4 years.

President Herman Wells of Indiana warned of the dangers of new I.H.E. with small enrollment. I recall that many of the new I.H.E. that I studied were altogether too small.

President Wells wrote:

> "They [new institutions] would offer none of the opportunities for the economies of scale that must be sought in operating budgets. On the capital side they would be enormously costly. They would tend to accelerate the rise in the college-attendance ratio and to lower average national admissions standards at precisely the time when moderate adjustments in the opposite direction are indicated, and they would offer a smaller promise of gains in faculty productivity than exists in the established institutions."

When excess capacity prevails there is a case for increased enrollment. Thus the President of Johns Hopkins would admit from 75 to 100 more students without additional cost, and Oberlin had under consideration a program under which a 4 quarter system would include one quarter for vacation and one quarter away on academic work. The college would then double its capacity. The President of Case Institute informed me that a rise of enrollment from 1,200 to 1,500 would be an economical move as unit costs declined. A generation ago Reeves estimated that a college of 300 would cost 50 percent more per student than a college with 850 students. Spokesmen for colleges with enrollment averaging 300 admitted that a rise of enrollment by 100 would put many in the black.

At New York University, with record enrollments, the dangers of rising enrollment were nevertheless noted:

> "Perhaps the best plan for New York University is an elastic one that sets up standards in terms not only of the product of Metropolitan high schools, but also of the ability of the University financially to support its programs. There is a diminishing return to great size. At one point the larger student body will call for new physical facilities and perhaps for a quality of staff that is rare and expensive. . . . Here it is not necessary to freeze enrollment at either a high or a low point with respect to any division within New York University, but rather to decide limits in terms of the facilities and staff that may be secured . . ."

It is not always easy to tie the size of an institution to its costs. This is shown in the following table. It might be expected that universities with average enrollment of 8,544 would have much lower unit costs than liberal arts colleges with 973 students on the average. The greater size undoubtedly makes for lower unit costs; but the expensive curricula in the universities, e.g. graduate work, more than offsets this. The low unit costs (and small size) of theological schools is explained by low faculty salaries and low plant costs. Similar considerations explain low unit costs of the junior college, which also are small. The professional schools are small and yet have high unit costs. The explanation is expensive instruction as well as small numbers.

Average enrollment and expenditures per resident student, 1956

	Enrollment	Expenditures
University	8, 554	$1, 334
Liberal arts	973	699
Teachers' college	1, 202	725
Theological	1, 259	698
Other professions	483	1, 538
Junior college	668	469

Source: From *Office of Education Publications.*

F. EXCESS CAPACITY

With plant additions rising to $3 billion yearly the case for improved use of plant is strong indeed.

> "Plant use is much less efficient than it might be. Resistance of students and faculty to afternoon and Saturday classes is one important cause of waste. But the responsibility lies in part with administration also. They have shown little interest in studying the utilization of plant.
>
> "Returns to a questionnaire on new IHL or new schools also reveal that the opening of these institutions or schools and their locations were often not subjects of adequate and careful examination. An over-all survey of professional schools also points to bad distribution. Large economies might be had by greater centralization of schools with high unit costs, combined with transportation subsidies for students.
>
> "In the light of the fact that total capital costs on existing plant are approaching $3 billion per year, an improved use of plant through increased access in unpopular hours, through improved matching of size of class and enrollment, through central control of assignment of space, through longer school year, through more considered establishment of new units and location on improved theories of location—through these and other means, savings as large as $1 billion a year by 1970 are within the realm of the possible." [49]

President Millett had this to say about use of space.[50]

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[49] S. E. Harris, *op. cit.*, passim.

[50] J. D. Millett, "Colleges Can and Must Be More Efficient," *College Admissions*, May, 1958, p. 56.

> "... a resident campus ought to set a 70 per cent average utilization per 39-hour week as its goal. Admittedly this is a substantial improvement over the proportion of use which now obtains on most campuses. For laboratories the goal should be 50 to 60 per cent utilization. Many institutions could almost double their enrollment on this basis alone. Such a high degree of utilization means course scheduling so that there will be more students in class on Tuesday, Thursday, and Saturday mornings and every week-day afternoon...."

More effective use of space can be achieved by reducing courses, by eliminating costly space or increasing the use of available space. It is not easy to get ideal space utilization. In most places, interest in space utilization is not great, and where studies have been made utilization of space is generally low indeed. A California Report of 1955 proposed a standard of 36 scheduled hours per week with College enrollment, after the first month of the term or semester, averaging 67 per cent of room capacity, i.e., the number of student stations the room will accommodate. But even this is considered a very high standard.[51]

Business men find it difficult to understand the wasteful use of space in I.H.E. The explanations lie in the unwillingness to have classes in the afternoon, by both students and faculty; the bad distribution between Monday, Wednesday and Friday's classes as against Tuesday, Thursday and Saturday. The long vacations and other shutdowns further reduce use. Athletics, need for employment, the failure to match classrooms with teaching requirements contribute towards the same ends. A committee of registrars in the spring of 1956 sent an inquiry to its members. Of the 961 out of 1,400 members who responded, only 25 per cent reported studies of space utilizations and few were adequate.

The percentage of possible student-station period utilization in general classrooms in state controlled I.H.E. in Michigan in 1956 based on a 44-hour week was as follows:[52]

Monday	42.7	Tuesday	33.6
Wednesday	38.5	Thursday	33.3
Friday	36.6	Saturday a.m.	5.9

G. Student Aid

We have commented on the relation of student aid to tuition income. But we should not stop there. There is, for example, the problem of the student aid mix. Much can be said for increased recourse to loans, to employment, and to guarantee of loans. A billion dollars paid out in loans is much less costly than a billion of scholarships. The former is repaid and therefore becomes available for repetitive use. In some institutions, additional tuition income, as William Bowen has shown, is absorbed excessively by increased student aid. But here what is also relevant is the increasing proportion of aid given from outside sources. This also suggests another weakness in aid policy. We need to know more and students need to know more about all sources of student aid. Outside funds are not always integrated well with funds available from the I.H.E. Some students get too much and others too little because of the gaps in knowledge. Investment aid funds could also be greatly improved, even though we cannot expect many repetitions of the $10,000 loan fund for Harvard in the second quarter of the 19th Century which has escalated to more than $2 million today.

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[51] *A Restudy of the Needs of California in Higher Education*, 1955, pp. 319–21.

[52] Space Utilization and Value of Physical Plants in Michigan Institute of Higher Education, *The Survey of Higher Education in Michigan*, Staff Study No. 9, 1958, pp. 82, 96, 124, 128.

13. RATIONALIZATION OF EXPENDITURE POLICIES

Existing institutions are lax in considering the priorities of programs. The IHE are similar to the U.S. Government in their frequent failure to consider new programs and their costs in terms of an examination of all alternatives. In dealing with the U.S. Budget, the Appropriations Committees are divided into numerous sub-committees. Hence we fail to get an overall appropriations policy. Similar weaknesses prevail in budgeting by IHE.

The President of the University of Pennsylvania in his 1956 Report quite rightly commented:

> "We must be prepared also to adjust existing academic practices in the interests of efficiency in teaching. For example, without sacrifice of quality, it might be possible to re-deploy the most competent teachers so that a greater percentage of them are assigned to the larger classes; to extend the use of assistance so as to relieve the teaching staff of routine administrative duties; to expand the application of audio-visual aids. At the same time the individual student must be encouraged to assume greater responsibility in the educational process, toward the end that the teacher will be relieved of much of his present duties to transmit hourly fundamental information which is really available in textual form."

In his 1955 report he said that the university would determine which programs are "(1) the most central and essential or traditionally the strongest; (2) more peripheral, specialized, or currently less developed at the university; (3) relatively narrowed or highly specialized academic activities making smaller contributions to general education; (4) inappropriate to the general educational objectives of the institution."

Under great pressure such as in the Great Depression, drastic measures will be taken. In ordinary circumstances the IHE will escalate expenditures, and then seek the funds required for the new and expanding programs, but an economic crisis brings drastic measures. As I noted in my book:

> "Under strain and stress of costs colleges will take strong measures to cut costs. In the midst of the Great Depression, for example, one survey showed that the following methods were used to reduce expenditures at college:
>
> 1. Elimination of miscellaneous expenses which do not concern directly the instruction of students. (110 cases)
> 2. Reduction in the cost of maintaining and operating buildings and grounds. (113)

3. Increase in the load of faculty by not making appointments to vacancies. (81)
4. Rearranging courses so as to enlarge the size of classes or so as to give courses in alternative years of semesters. (68)
5. Postponing the purchase of library books. (61)
6. Reducing expenditures for travel. (80)
7. Reducing clerical help and office expense. (78)
8. Undertaking no new construction except where special funds are provided. (92)

Numerous other economies were made: reducing expenditures for publicity bureaus and university press publications, postponing or denying all leaves of absence with pay, and so on."

Endowment as a Source of Increased Revenue

James H. Stauss*

The pressures on private colleges and universities are indeed demanding that they find increasingly productive sources of finance for current operations (current funds) and capital outlays (plant funds). Yet, because they must also plan a viable future and meanwhile try to countervail "inflation," they should elevate the potential endowment support of future operations. In this setting the outlook for endowment policies favors innovation: the erosion of stereotypes of policy and the adoption of new ideas, a prudent modernization of endowment toward improved investment performance of the funds and increased revenue from them. The outlook favors an emphasis on endowment growth and a restructuring of funds, together with innovative systems for optimum endowment service to both the educational present and the educational future.

Definition of endowment.—"Endowment" denotes funds (*1*) held in assets external to the college or university, and (*2*) having the primary function of contributing revenue for operations. The term implies expectation and projection of long-run (indefinite) continuity of this primary function. Endowment funds are the source of an ongoing support of operating budgets, and therefore they represent provision for both the present and the future, though service to the one may conflict with service to the other. The term implies further, an investment management whose maneuverability, discipline, and tests of proficiency have an external orientation free of the concerns that attend internal financial commitments. Endowment exclusively in external assets and management's interplay with outside investment alternatives are conducive to an acceptable investment performance of endowment. This definition of endowment thus looks to the model (desirable and workable), not necessarily to the matter-of-fact.

Scope of endowment.—Within an endowment the separate professional management of the marketable securities portfolio is usually a prerequisite of improved investment performance of the funds. Toward proficient management of the securities portfolio and other asset-holdings, the funds are separable as follows: endowment (*1*) in marketable securities, and (*2*) in special investments, such as real estate, oil and gas properties, or direct business ownership, where division (specialization) of professional management also enhances the quality of managerial performance. Upon appropriate notation of the college's interest as beneficiary of trust funds held externally, endowment may well include (*3*) funds in irrevocable trust having the primary function of contributing revenue for operations.

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The endowment report may itemize supplemental funds not legitimately within current endowment but relevant to the endowment position: that is, (*4*) internal endowment commitments, such as loans by endowment to other college funds, quasi-ownership of residence halls or other facilities, or similar commitments to a corporation de facto a branch of the college or university; and (*5*) annuity and life-income funds on irrevocable donation, paying donor or other beneficiary an agreed income.

These supplemental funds are "suspended endowment," currently having multiple financial functions or else a primary function other than contributing revenue for operations. Moreover, endowment commitments within the college have an orientation incompatible with the endowment model. Investment income on an internal commitment (e.g., rental yield imputed to asset-holding in residence halls) is usually the counterpart (offset) of assigned expense against other revenues or receipts, rather than in income directly from external sources and investment conditions. In any case the "earnings" on internal endowment commitments are the outcome of administrative (internal) ratemaking at variance with the external orientation of both investment management and the investment performance of endowment. Although such commitments are relevant to the endowment position, the Treasurer should treat the endowment at a magnitude net of them.

I. SYSTEMS OF INCREASED REVENUE FROM ENDOWMENT

At a total of perhaps $12 billion, college and university endowments have a significant potential for increased contribution to the financing of operations. This potential for the future is in the long-run growth of endowment, and for the present is in the systematic current partaking of growth benefits. The basic alternatives toward increased current revenue from endowments are: (*1*) a modus operandi of exclusive "yield support" consisting of dividends, interest, and other yield (income) on endowment principal, or (*2*) a system of comprehensive "yield and capital gain support" consisting of yield and a portion of capital gain (withdrawal of principal).

But yield support alone is a poor means of endowment contribution to the financing of current operations: that is, unless the evidence is persuasive that yield support alone is compatible with the objectives of good endowment growth, good investment performance of endowment, and adequate financing of current operations. Comprehensive (yield and appropriated capital gain) support, involving systematic withdrawal of endowment principal (appropriated capital gain), is usually compatible with these objectives. The prima-facie case for comprehensive support is hard to overturn.

Yale's system of increased revenue from endowment.—The *Report of the Treasurer* (John E. Ecklund) of Yale University for the fiscal year 1965–66 attracted wide attention to the format of comprehensive endowment support of current operations. This report and the *Report* for the fiscal year 1966–67 presented the rationale of Yale's recent overhaul of its endowment policies, and outlined its innovative system of increased revenue from endowment and the underlying policy of investment for best overall (yield plus capital gain) return on endowment.

Yale appropriated $1.975 million of capital gain for support of 1965–66 current operations: that is, an appropriation at less than .5% of the market value of endowment (June 30, 1966). Together with 1965–66 net yield at about 3.77%, this appropriation produced a comprehensive support of current operations still below 4.5% of the market value of endowment (June 30, 1966).

The Yale system provides a method of firmly budgeting (predetermining) Endowment Support (symbol "I") of current operations. This method, the "University Equation," has characteristics and measurements related to Endowment Growth, involving: (*1*) Input to endowment including yield, capital gain, and donations; (*2*) a Rate of Input, relating Input (gross growth) to Market Value "E" of endowment; (*3*) Endowment Support "I" (output or withdrawals from endowment) to the financing of current operations; and (*4*) Net Growth, the difference between Market Value "E" at the end of a fiscal year and at the beginning. That is: let E = opening Market Value and E' = closing Market Value. Then: Net Growth $= E' - E$; and the Rate of Net Growth $= (E' - E)/E$.

The method requires estimate (extrapolation) of a percentage Rate of Endowment Input "R_E" computed by a weighted moving average of growth (Input) experience over a lengthy span of years. The firm budget commitment made "now" for "next year" looks to the Rate of Endowment Input "R_E", projecting a norm of Input (yield, capital gain, and donations) relative to Market Value "E" of endowment; that is: Input Norm $= R_E \cdot E$, where E = opening Market Value or (alternatively) = an opening Market Value Norm. Within the matrix of "R_E", the method pre-determines the annual Endowment Support "I" of operations.[1]

For any current fiscal year, "I" is an actual revenue at a Rate of Endowment Support, such as 4.5%, on opening Market Value "E" of endowment: that is, let $R_S = I/E$. Actual "I" is a predetermined revenue, realizing a firm budget projection (upper limit of Endowment Support) that involves annually two commitments: (*1*) to continue for the upcoming fiscal year a current amount of Endowment Support "I", and (*2*) to augment this Support Renewal component (equivalent of "I") by a second component, an additional revenue proportionate to the prospective Endowment Growth assignable to the upcoming fiscal year. That is: let I' indicate the firm budget projection for the upcoming year. Then: $I' = I +$ Support Increase component. Support Increase $(I' - I)$ must be determined.

The firm budget projection (upper limit of Endowment Support) for the upcoming year depends upon measurements carried forward from the current year. The working hypothesis of this procedure is that the upcoming year will be an approximate imitation of the current year. It is also a prudent hypothesis: that de facto the upcoming endowment experience will at least measure up to current dimensions, or that long-run Endowment Growth will compensate for deficiency. Therefore, alongside the Support Renewal component at an amount equivalent to the current Endowment Support "I", let the following measurements be carried forward to the upcoming fiscal year: (*1*) Rate of Endowment Input "R_E"; (*2*) Market Value "E" of endowment at the beginning of the current year; and (*3*) current Rate of Endowment Support "I/E", i.e., R_S.

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[1] See *Report of the Treasurer for the Fiscal Year 1966–67* (Bulletin of Yale University, January 15, 1968), pp. 6–13. My analysis of the Yale method is a paraphrasing of the text of this report.

In order to produce a firm budget projection of Endowment Support (I′) for the upcoming year, the Yale method augments the Support Renewal component (current support) "I" by applying to it a Rate of Endowment Support Increase "R_I": that is, Support Increase component$=R_I \cdot I$. Then: $I'=I+R_I.I$.

Technically, this Rate of Endowment Support Increase "R_I"=estimated Rate of Endowment Input "R_E"−current and carried forward Rate of Endowment Support "R_S": that is, $R_I=R_E-I/E$. Then: $I'=I+(R_E-I/E)I$.

The operational meaning of "R_I" is approximately as follows: let the Support Renewal component be augmented by a Support Increase component proportionate to a norm of Net Growth of endowment. That is: let a weighted moving average of Net Growth experience be computed, and let the norm of Net Growth $(E'-E)$ be expressed as a Rate of Net Growth. Then R_I is proportionate to this Rate of Net Growth. Conceptually, the operational meaning of "R_I" is that Endowment Support and Net Growth of endowment should be correlated. The Support Increase component at "$(R_E-I/E)I$" accomplishes this objective in a matter-of-fact way.

Basic systems of increased revenue from endowment.—Systematic endowment support of current operations may be adopted on one of the following plans among others:

1. Endowment Support (withdrawals from Input) currently at a predetermined Rate of Endowment Support (R_S), such as 4.5%, on Market Value (E) of endowment, where E=Market Value at the beginning of the current fiscal year or (alternatively)=an adjusted Market Value (finally set before the end of the current year) allowing for gifts (and their "earning time") and certain other cash flows during the year. "R_S" might well be a Rate meshing with (*1*) yield rates on high grade bonds over an appropriate span of time and/or (*2*) annual rates of the "dividends and retained earnings" return on an adjusted Market Value of the equities portfolio. This Rate of Endowment Support is ongoing, until the stable R_S level is clearly incompatible with its guidelines and therefore merits revision. This plan has the fault of an Endowment Support vulnerable to price fluctuations and swings in the securities markets. However, a Support Stabilization Reserve (within endowment) and/or a Revenue Stabilization Reserve (maintained by allocation from gifts) may alleviate this shortcoming.

2. Endowment Support currently at a pre-determined Rate (R_S) on Market Value (E) of endowment, where E = a moving average of actual end-of-the-year Market Values for the current and recent years or (alternatively)=a moving average adjusted for gifts and

certain other cash flows within the individual years of the base averaging period (including the current year). A three-year moving average will correspond fairly well to the duration of price cycles in the stock markets over the past twenty years, though the experience of the 1960's and contemporary uncertainties may suggest a four-year or a five-year moving average.

3. Endowment Support at a pre-determined Rate (R_S) on Market Value (E) of endowment, where $E=$Standard Market Value, a norm of Market Value experience assignable annually to the beginning of the fiscal year. This norm may be: (*1*) a moving average of actual Market Values where the averaging period is a modern short run; (*2*) a moving average or a weighted moving average having a longer base period; (*3*) a moving average adjusted downward for hypothetical Endowment Support during any part of the base period prior to systematic appropriation of capital gain; (*4*) an assignable moving Market Value dependent upon the endogeneous operation (internal determinants) of an ongoing Endowment Support System.

4. Endowment Support at a pre-determined Rate (R_S) applying to an Investment Return (P), where $P=$yield$+$capital gain. Support is at an Amount (I): that is, $I=R_S \cdot P$. The plan may be such that this $P=$Return for the current fiscal year or (alternatively)$=$Return for the previous fiscal year or (alternatively)$=$a moving average of actual annual Returns or (alternatively)$=$another moving Standard Return.

5. Endowment Support at a pre-determined Rate (R_S) applying to an Investment Return (P), where $P=$yield$+$retained earnings. Support is at an Amount (I): this is, $I=R_S \cdot P$.[2] The plan may be such that the percentage $R_S=100\%$: that is, Endowment Support $(I)=$yield$+$retained earnings. The plan has the usual alternatives in measurement of the Investment Return (P) as an Actual or a moving Standard quantity.

6. Endowment Support inclusive of a "yield component" at actual Yield (Y) or a Standard (moving average) Yield, and a "gain component" at a pre-determined Rate (R_S) applying to Capital Gain (G). Support is at an Amount (I): that is, $I=Y+R_S \cdot G$. The plan has the usual alternatives in measurement of the Gain (G) as an Actual or a Standard (moving average) quantity.

7. Endowment Support upon one of the foregoing plans with Tolerance Limits: a minimum Support guaranty (floor L) and/or a maximum Support commitment (ceiling L′). Support at any pre-determined Amount (I) may vary annually within the Tolerance Limits but cannot transgress them. At any pre-determined I below L, the additional appropriation from endowment$=L-I$; at any pre-determined I above L′, Endowment Support is confined to L′.

8. Endowment Support directly at a pre-determined Amount (I), either upon a continually stable annual commitment of endowment Input or upon a commitment systematically augmented annually. This plan of comprehensive "yield and capital gain support" differs from (*1*) an emergency (exigent relief) appropriation above yield, where the usual practice is exclusive "yield support" consisting of dividends,

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[2] See Milton Friedman (ch.), "Report of Committee on Financial and Investment Policies," *American Economic Review*, LVII (May 1967), 711–14.

interest, and other yield (income) on endowment principal, and from (2) a modus operandi of continual emergency appropriations above yield, where the Trustees have not adopted systematic comprehensive support of current operations.

Perspectives on endowment as a source of increased revenue.—The questions and problems concerning endowment support of operations are not new; and sketchy outlines of policy toward increased revenue from endowment were at issue some years ago.[3] But now, alongside the increased urgency to have more productive sources of current finance, the literature on endowment policies is more extensive and technical. The principles of management of endowment funds, and of accounting and financial reporting, are reasonably well up to date.[4] An insightful study of the law bearing on endowment policies is available.[5] Policies toward improvement of the investment performance of endowment and workable means of increased revenue from endowment are major concerns of the Ford Foundation's Advisory Committee on Endowment Management, which has reported its findings and recommendations.[6] My comments are simply an elementary "approach" toward constructive decisions to make endowment a source of increased revenue for current operations.

II. DEFINITIONS

The following definitions, preliminary to an outline of the main topics of endowment policy, are for descriptive convenience rather than for technical precision and usefulness.

1. *Principal* (of an endowment fund): an amount (money terms) of asset-holding at a specific date.
2. *Market value* (of principal): a money sum representing present worth of endowment; i.e., a money sum expressing current prices (and price approximations) of specific items in a holding of endowment assets.
3. *Book value* (of principal): a money sum of original donation and/or original appropriation to endowment. (A different definition not employed here: a money sum of expenditure, i.e., original cost, for the specific items in a holding of endowment assets.)
4. *Yield* (on principal): dividends, interest, rents, and similar investment returns during a specific period.
5. *Capital gain* (on principal): an appreciation of market value exclusive of new donations and appropriations to endowment during a specific period.
6. *Investment return* (on principal): endowment performance including both yield and capital gain (adjusted for loss) during a specific period; i.e., yield + change in market value exclusive of new donations and appropriations during a specific period.

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[3] See Seymour E. Harris (ed.), *Higher Education in the United States—The Economic Problems* (Cambridge: Harvard University Press, 1960): "Investment Policies," pp. 24–28; "Investment and Endowment Policies," pp. 203–47.

[4] *College and University Business Administration*, rev. ed. (Washington, D.C.: American Council on Education, 1968), see index.

[5] William L. Cary and Craig B. Bright, *The Law and the Lore of Endowment Funds* (New York: Ford Foundation, 1969).

[6] Advisory Committee (Robert R. Barker, ch.), *Managing Educational Endowments* (New York: Ford Foundation, 1969). See McGeorge Bundy, "The President's Review," in the Ford Foundation, *Annual Report*, 1966, pp. vii–viii.

7. *Yield rate* (on principal) : yield/principal.

8. *Investment return rate* (on principal), from a comprehensive standpoint: investment return/principal. (From a multiple standpoint: any one of several rates on principal, involving a particular return such as yield, interest, dividends, retained earnings, or change in market value.[7])

9. *Appropriated capital gain* (withdrawal of principal) : any portion of capital gain (realized gain and/or withdrawal of principal equivalent to a net unrealized appreciation) converted into endowment support of current operations.

III. ENDOWMENT POLICY AREAS

Endowment policies, representing decisions on the objectives, structure, management, and use of funds, are responses to several major problems concerning these matters. The following classification of policies emphasizes the problems.

1. *Policy applicable to an investment pool.* An investment pool merges endowment funds, some or all of which have yield restricted as to purpose. Here the decision-making is related to size of shares in the pool, a corresponding pro rata assignment of the pool's yield and/or other benefits for appropriate purposes, and the updating of fractional claims (shares) upon input of new participating funds.

A major issue in this policy area is: valuation (sizes) of shares and pro rata assignment of yield on the basis of market value *v.* allocation on the basis of book value. Endowment pooled at market value under present conditions typically exceeds endowment at book value, and book values of newer funds are closer to market value than are the book values of older funds. Market valuation therefore produces an enlargement of shares in the investment pool that is proportionately greater for older funds: that is, market valuation (sizes) of shares and a corresponding pro rata assignment of yield favor older funds and the restricted purposes tying these funds.

2. *Policy on investment objectives.* The problem is whether or not to manage endowment with the predominant objective of investment in fixed-yield securities; or from a different standpoint, whether or not to manage endowment with a major objective of growth.

If the decision is against predominant investment in fixed-yield securities, the policies must include determination of a very substantial portfolio ratio of equities to fixed-yield securities, and in unusual circumstances, perhaps also a significant proportion of other investments. If the decision favors a major objective of growth, the policies must include a corresponding adjustment of the equities portfolio to an emphasis on common stocks relevant to highly promising growth potentials in the economy.

New donations and appropriations aside, endowment growth is largely a matter of acquiring capital gain. Growth typically (but not exclusively) involves: (*1*) capital gain as a by-product of assetholding to realize yield; and alongside this slow-growth factor, (*2*) enlargement of capital gain at the sacrifice of yield, upon shift in asset-holding favorable to enlargement.

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[7] See Friedman, "Report of Committee on Financial and Investment Policies," *op. cit.*, pp. 711–14.

A high ratio of equities to fixed-yield securities is supported by persuasive evidence of superior long-run performance (investment return) of common stocks over bonds.[8] Surveys of college and university funds indicate a significantly increased proportion of equities in the pattern of endowment diversification over the past several years, though still a proportion of bonds (averaging above 25% of the over-all market value of 71 representative endowment funds) indicative of cautious investment policies.[9]

This policy area is the home of investment compromise, producing an endowment diversification meshing with the interplay of diverse objectives, expectations, and attitudes. New and old attitudes toward risk-taking and toward the legal and ethical obligations of endowment trust, sluggish investment mores, and the history and uncertainties of the securities markets, provide the background of policies.

Securities history, strongly influencing policy decisions, includes developments such as: the last decade of low industrial stock yields relative to high industrial bond yields; the previous two decades of opposite experience, together with some ongoing assent to the theory that stocks (riskier investment than bonds) should pay yields typically above bond yields; the strong upward trend of common stock prices since 1949, but during the 1960's at a market sometimes vulnerable to temporary fluctuations and intervals of anxiety; the attractive record (capital gains) of numerous rapid-growth stocks during the last ten years; the large expansion of institutional (insurance companies, savings institutions, pension and retirement funds, mutual funds, etc.) buying of stocks during the 1960's; but alongside this buying, a significantly shorter expansion of new common stock and convertible bond issues and estate sales. Investors generally have had strong bent for stocks (capital gains) to meet the tempo of current and prospective "inflation," and they have had fairly firm confidence in the economy's future growth and investment potentials over a wide range of corporations.

During the 1960's, within the offices of endowment management, an increasingly strong interest in capital gain prospects has swung investment compromise (endowment diversification) markedly toward the objective of growth. Yet, two tempering influences have sustained substantial investment in fixed-yield securities: (*1*) concern for adjustment of the securities portfolio to risk differentials among alternative asset-holdings, a concern favoring diversification to avert a preponderance of uncertainties; and (*2*) cautious mores, representing hunch that a dollar of fixed yield is "more reliable" than a dollar of prospective capital gain, or reflecting uneasiness about legal and ethical constraints on sacrifice of yield, risk of endowment principal, and current use of capital gain. Another influence, (*3*) concern for adequate financing of current operations, has carried a predilection for yield as the mainstay of endowment's contribution to revenue.

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[8] See L. Fisher and J. H. Lorie, "Rates of Return on Investments in Common Stock," *The Journal of Business*, XXXVII (January 1964), 1–21; Alfred Cowles 3rd and Associates, *Common Stock Indexes, 1871–1937* (Bloomington, Ind.: Principia Press, Inc., 1938); W. Braddock Hickman, *Statistical Measures of Corporate Bond Financing since 1900* (Princeton: Princeton University Press, 1960), pp. 288–91, 298–302; David Durand, "A Quarterly Series of Corporate Basic Yields, 1952–57, and Some Attendant Reservations," *The Journal of Finance*, XIII (September 1958), 348–56; U.S. Bureau of the Census, *Statistical Abstract of the United States*, annual issues.

[9] See Boston Fund, *The 1968 Study of College and University Endowment Funds*, and previous annual studies prepared by Boston Fund (111 Devonshire Street, Boston, Mass.).

3. *Policy concerning investment performance of endowment.* Decisionmaking in this area can (should be) conducive to increased investment return combining yield and capital gain.

The investment performance of endowment is the outcome of management's activity and of market, corporate, and other outside influences. Management's activity includes the continual evaluation of alternative investment opportunities on a comparative basis, and the consequential selection and shifting of portfolio assets. Management builds the equities portfolio and the more inclusive securities portfolio out of *investment potentials*, including not only the actual assets held at a specific date but also other opportunities (securities) available to the portfolio upon shift of asset-holding. This continual evaluation and selection of assets requires matter-of-fact guidelines (aims), among them a workable goal of "optimum" current return.

Portfolio management should proceed within a framework of policies toward the "best" investment performance, where the "best" performance involves (*1*) improvement of return on endowment and (*2*) adjustment of asset-holding and investment return to an acceptable uncertainty (incurrence of risk) about future market values and returns. Management in this style weighs asset-holding mainly for capital gain against asset-holding mainly for yield, and seeks a portfolio balance (diversification) favoring endowment growth yet not neglectful of aversion to risk.

The following outline sketches several traits of investment (asset-holding) for growth: investment objectives; current and long-run aspects of growth; inducements warranting sacrifice of current yield and/or current capital gain to get a prospective long-run reward. Modern conceptions of "best" performance, though they diverge regarding provision for risk, have a common emphasis on investment for growth as the main route to increased return.

Investment objectives.—Modern conceptions of "best" performance begin with a common approach: "Maximum" long-run return (endowment growth) should be the predominant objective in portfolio management, and current return at "optimum" should serve this objective. (That is: let the *current investment period*, at least a part of which is in the future, be a span of time appropriate to an end-of-the-period evaluation of investment performance. Then: management should select asset-holdings having prospect of a current investment return most favorable to endowment growth.)

Current and long-run aspects of endowment growth.—Management investing for growth may aim at (*1*) current appreciation of market value, and endeavor to get this capital gain at the sacrifice (trade-off) of asset-holding for current yield. Further, management may aim at (*2*) long-run enlargement of capital gain, and endeavor to get from it a reward of "net benefits" worth the sacrifice (trade-off) of asset-holding for current yield and/or current capital gain. Return may also come out of (*3*) long-run enhancement of yield above a low current level of yield at sacrifice to get capital gain; but a yield reward of this kind usually has dubious promise.[10] These options toward a portfolio balance imply that management, anticipating a *long-run growth reward*, may invest at sacrifice of "maximum" current return.

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[10] See Frederick C. Dirks, "Recent Investment Return on Industrial Stocks," *The Journal of Finance*, XIII (September 1958), 370–85.

The objective of "maximum" long-run return (endowment growth) may require a margin of asset-holding aimed at benefits other than current yield and/or current capital gain. (That is: let the current period have alternative investment potentials, at yield and capital gain projections to the end of the period. Let management expect *long-run growth potentials*, at capital gain and/or yield projections beyond the current period. Then, if management expects a growth reward of "net benefits" from these growth potentials: management may reduce asset-holding aimed at current return, and increase asset-holding to capture the long-run growth reward.)

Non-postponable asset-holding for a growth reward.—Management is reasonably averse to investment for long-run capital gain at the sacrifice of asset-holding for current yield and/or current capital gain. That is, management has aversion to sacrifice of "maximum" current return, and prefers postponement of competitive asset-holding aimed at a long-run growth reward.

But this aversion to sacrifice of "maximum" current return is conditional. If the prospective growth reward is sufficiently attractive and if the asset-holding to capture it is not reasonably postponable, then management has the inducements to forgo investment aimed at "maximum" current return. Non-postponable asset-holding, aimed at "optimum" current return, occurs where, prospectively, the assets promising an attractive growth reward will be (*1*) "unavailable" later, or (*2*) offered later at an unfavorable purchase price, yet where management cannot efficiently spend time and effort to anticipate the timing (threshold) of the expected deficiency or price movement; or where (*3*) management's activity does not include anticipation of temporary or short fluctuations in securities prices or (perhaps) the longer market swings. Current return at "optimum" may therefore differ from "maximum" current return.

Modern conceptions of "best" performance thus present a prima-facie sanction of investment for growth as the main route to increased return: "Maximum" long-run return (endowment growth) should be the predominant objective in portfolio management, and current return at "optimum" should serve this objective. "Optimum" current return, as a workable performance standard (aim), may well represent an aggressive endeavor to capture a long-run growth reward and, correspondingly, a substantial margin of investment at sacrifice (trade-off) of asset-holding for current return. The portfolio balance may well have these traits of investment (asset-holding) for growth.

Investment performance and aversion to risk.—Modern conceptions of "best" performance, though they have a common emphasis on growth, diverge regarding portfolio adjustments (if any) congruous with aversion to risk. Adjustment to risk differentials among investment opportunities may temper (downgrade) performance on the standard of "optimum" current return. The endowment diversification may (usually will) have asset-holding where a dollar of current yield has risk preference over a dollar of current capital gain, or where a dollar of current capital gain has risk preference over a dollar of long-run growth reward. (That is: let a prospective portfolio composition meet the guideline of "optimum" return for the current investment period. Then: "optimum" current return might be a sacrificed in favor of a lower, less risky prospective return from a diversification of assets having an acceptable incurrence of risk.)

Modern conceptions of "best" performance typically support a high tolerance of risk in asset-holding. But matters such as the following, relevant to (*1*) the extent of managerial freedom to forgo asset-holding mainly for yield, are at issue: (*2*) the permissible degree of portfolio concentration in "untested" corporations; (*3*) the permissible degree of investment for long-run growth reward at the sacrifice of current return combining yield and capital gain. Portfolio management should proceed within a framework of policies indicative of the tolerance of risk in asset-holding.

Investment performance and endowment support of current operations.—Except insofar as legal obligation may require investment for current yield, neither the method of endowment support of current operations nor the need for support should influence portfolio management. To the extent that the portfolio includes asset-holding for yield, the endowment diversification should be on the guidelines of "best" perfomance, not on the dictates of a modus operandi demanding a "yield support" of current operations.

4. *Policy on managerial strategy relevant to market fluctuations.* The Trustees should define the scope of managerial discretion and/or commitment to exploit market fluctuations.

Proficiency toward the "best" investment performance usually requires that management not attempt exploitation of temporary or short fluctuations in securities prices. But competent managers should have substantial discretion to anticipate the longer market swings and seek benefits from them. Perhaps typically the exploitation of market swings is too fraught with difficulties, or too enervating of the more productive specialization in long-run opportunities and prospects, to be an assigned managerial function.

This policy area, largely a matter of swings in securities prices, needs innovation: development of a strategy against predicted and/or actual market slides, a strategy including timely and substantial shifts of asset-holding to fixed-yield securities (assets also functioning as cash). The strategy of high yield (liquidity) preference at the outset of a market slide should complement investment for growth, yet it should be workable without unduly offending managerial specialization in long-run opportunities and prospects.

5. *Policy governing managerial organization and style.* Policies in this area involve the selection and evaluation of managers, and define the managerial structure and duties. Here the Trustees, reserving supervision to themselves and/or their committees, should delegate the portfolio to professional management.

6. *Policy determining the endowment contribution to the financing of current operations.* The major problem is whether or not to have a modus operandi of exclusive "yield support" consisting of dividends, interest, and other yield (income) on endowment principal: or from a different standpoint, whether or not to adopt a system of comprehensive "yield and capital gain support" consisting of yield and a portion of capital gain (withdrawal of principal).

If the Trustees favor comprehensive support of current operations, they may adopt one of the systematic plans outlined before. This answer implies: (*1*) an endowment contribution compatible with policies toward improved investment performance, and (*2*) a workable compromise between provision for the present (support of current operations) and provision for the future (build-up of endowment).

Comprehensive (yield and appropriated capital gain) support, involving systematic withdrawal of endowment principal, is a counterpart of "best" performance, permitting endowment diversification on the guidelines of "best" performance. But exclusive yield support is not compatible with policies toward improved investment performance. If a modus operandi of exclusive yield support prevails and if the need for current revenue (exclusively yield) from endowment is a "large" demand, then management may well have to diversify the portfolio at a yield exceeding the dictates of "best" performance: that is, reduce unduly the asset-holding for capital gain and therefore the investment return (yield and capital gain together).

Comprehensive endowment support may permit (encourage) financially an improved educational quality and/or institutional position that attracts (generates and enhances) both gift support of current operations and donations to endowment, and also gift support of capital outlays. To this extent the endowment support of current operations is also provision for the future.

But a system of support including withdrawal of principal is immediately competitive with the build-up of endowment, because the system (*1*) cuts back the endowment growth: the larger the appropriated capital gain (marginal provision for the present), the larger the cutback on provision for the future. It also (*2*) provides a magnitude of current support subject to sacrifice (curtailment) on behalf of the build-up of endowment: the larger the build-up (provision for the future), the larger the curtailment of financial resources for current operations.

Systematic endowment support of current operations is therefore a compromise between provision for the present and provision for the future. This compromise involves the "financial plight" of the present, a plight justifying ample comprehensive (yield and appropriated capital gain) support of operations.

IV. GROUNDS FOR APPROPRIATION OF CAPITAL GAIN

The case for ample comprehensive support of current operations has the following sketch (headings): an urgent needs profile; satisfaction of needs through coverage of the gap between operating expenditures and revenue from students; upward pressures on operating expense; the gap between expenditures and revenue from sources other than endowment; drainage of yield through investment favoring capital gain; compensatory appropriation of capital gain.

Urgent needs profile.—The ongoing and expanding need for adequate resources in current operations has financial dimensions, but also performance (behavioral) commitments setting out what should be done (goals and priorities), quality expectations, and workable quality standards. These concerns apply essentially to educational performance, yet bilaterally also to the college's "style of life," where its residential, cultural, and extracurricular features interlock with education. Performance commitments, involving accommodation of goals and priorities to financial realities, reflect attitudes envisioning education at improved quality or at a less demanding perspective.

An Urgent Needs Profile should portray need in both behavioral terms and financial dimensions: *(1)* long-range goals (comprehensive planning) for current operations, facilities, endowment, etc.; *(2)* short-run and immediate priorities (budgeting); *(3)* layout of "urgent current needs" (emphasizing operations); *(4)* a record of achievements (toward priorities). The layout of "urgent current needs" is two-fold: *(a)* a schedule of needs specifically within currently-budgeted operating expense, and *(b)* a budget analysis differentiating (ranking) the additional needs excluded from the Budget for Current Operations upon lack of financial feasibility: that is, additional needs that would be brought within the Budget at each of several potential levels of operating expense above that actually projected.

Within the development office the Profile's counterpart is the Gifts Prospectus (formal or informal) and the Grant Application. But generally its counterpart is the fiscal-year Budget for Current Operations, where the layout of "urgent current needs" comes down to operating expense, operating revenue, and the adequacy of financial resources for significant progress within the goals and priorities.

Operating-expense/operating-revenue gaps.—Adequacy of financial resources for current operations has complex revenue (income) dimensions, mainly: tuition and related fees; revenues from miscellaneous sources (and governmental appropriations to public institutions); room and board charges and other revenues related to auxiliary enterprises; endowment income; and the large remainder (actual and/or desirable) of current operating revenue derived from gifts.

At a standard (normative) two-semester or other academic-year average of full-time students, the tuition fee usually covers no more than a fraction (e.g., two-thirds) of the educational cost (allocation of educational and general operating expense) of each student. At the usual projection and outcome, barring accidents, annual increase in fees (such as in a comprehensive charge including tuition and related fees, room charge, and board charge) produces additional revenue sufficient to cover but a fraction (e.g., three-fifths) of annual increase in operating expenditures. Revenue from students, either as budgeted (projection) or as realized (actual), is usually insufficient to cover operating expenditures. Revenue from other sources, filling out the shortage, must countervail special influences such as the typical lag of increased tuition behind increased expenditures and any deficit in admission (number) of new students or excess in attrition of students previously enrolled.

Revenue from sources other than students must therefore be "adequate" to have adequacy of financial resources (full coverage of expense) for current operations. This revenue must close the difference between total operating expenditures and some part of that total covered by revenue from students; that is, the *operating-expense/*

revenue-from-students gap. Other operating-expense/operating-revenue gaps, such as the shortage of revenue from sources other than gifts or from sources other than gifts and endowment, similarly indicate the financial requirements for current satisfaction of needs.

At any level of operating expense and lower level of revenue from stated sources, the gap-filling revenue must be "adequate" to have adequacy of financial resources (full coverage of expense) for current operations. This imperative pertains to financial feasibility from any one of three standpoints: (*1*) budget realization (actual outcome), revenue covering expense; (*2*) budget projection, expected revenue covering expected operating expense; or (*3*) budget differentiation (hypothesis), expected revenue falling at a shortage below prospective expense if additional urgent needs were brought within current operations: that is, (*3*) if a margin of additional urgent needs has been satisfied (rather than sacrificed) within the Budget for Current Operations, a margin of additional revenue would have been required for full coverage of the prospective operating expense. This additional revenue (hypothetical) measures an inadequacy of resources to get the additional urgent needs.

Where from the standpoint of (*1*) budget realization (actual outcome), or (*2*) budget projection, the gap-filling revenue does not bring total revenue up to a level matching total expense, the operating deficit implies additional financing. This additional financing measures an inadequacy of financial resources for current operations, though an inadequacy less damaging than lack of resources to make significant progress within the goals and priorities of the Urgent Needs Profile.

Upward pressures on operating expense.—At any budgeted level of operating expense and lower projected level of revenue from students and/or other sources, the difference (gap) between levels is usually wider than comparable differences in previous Budgets. Moreover, the usual outlook envisions enlargement, rather than stabilization or reduction, of the gap. The grounds for this outlook are compelling in most colleges and universities: that is, both "inflation" and the continual pressures to bring additional urgent needs within the Budget are major expense-increasing influences.

Both "inflation" and these pressures from the Urgent Needs Profile are major gap-widening influences, together with the typical lag of increased revenue (from students, miscellaneous sources, gifts, and/or endowment) behind increased expenditures. In numerous colleges the increased gifts, consisting of all receipts regardless of designation, have outpaced increased expenditures. And in some cases the outlook may prudently envision increased gifts sufficient to stabilize the *operating-expense/revenue-except-from-gifts gap*, especially if the outlook also prudently envisions endowment as a source of increased revenue. But notwithstanding that increased gifts have frequently outpaced increased expenditures, the drainage of gifts into endowment, into plant funds (capital outlay), and into grantor-specificed innovation (special projects), has contributed to the typical lag of increased gifts revenue behind increased expenditures.

Operating-expense/revenue-except-from-endowment gap.—Revenue from endowment, like any other revenue (e.g., from gifts), is a gap-filling inflow of resources that may be: (*1*) measured as actual outcome for a fiscal year; (*2*) projected in the Budget, and perhaps considered a potentially larger revenue countervailing any budgeted operating deficit; or (*3*) considered a potentially increased revenue permitting satisfaction of a margin of additional urgent needs and/or countervailing "inflation." The usual outlook envisions enlargement of the difference (gap) between total operating expenditures and some part of that total covered by revenue from sources other than endowment. The adoption of policies to make endowment a source of increased revenue complements this outlook.

The *operating-expense/revenue-except-from-endowment gap* demands a filling-out (coverage) from among several alternatives: (*1*) an increased yield coverage and/or (*2*) an increased (or initiated) capital gain coverage; or these measures failing, (*3*) reduced operating expenditures, cutting back the gap; or temporarily, (*4*) emergency financing, such as borrowing or forward use of current funds. But increased yield coverage is adverse to investment favoring capital gain.

Drainage of yield favoring capital gain.—Revenue from endowment is subject to investment policy that may, and usually does, sacrifice considerable yield (the traditional endowment income) in favor of capital gain from rising securities prices. Substantial endowment holdings consist of securities having a strong potential for capital gain, rather than securities having high yield rates. The drainage of yield may well be at a significant ratio (e.g., one-half) to yield realized. This prevalent investment policy, together with a modus operandi of exclusive "yield support," is therefore a significant influence (*1*) reducing the magnitude of endowment income as a gap-filling revenue, and (*2*) increasing the need for current operating revenue derived from gifts. Investment policy favoring capital gain, though beneficial, may well increase the burden of closing the operating-expense/revenue-from-students gap.

Compensatory appropriation of capital gain.—The typical posture of the Administration is that the college, providing for the educational present, should have redress for the drainage of yield. A system of comprehensive (yield and appropriated capital gain) support of current operations provides this redress.

V. STRUCTURE OF ENDOWMENT FUNDS

A system of comprehensive support of current operations is compatible with segregated funds having individually their own special conditions of management. But an *endowment merger* (investment pool) is the locale most congenial to systematic support including both yield and appropriated capital gain (withdrawal of principal). The merged fund may be set aside on two criteria: its eligibility for use of yield and withdrawal of principal; and its exemption from restraints demanding a continual accounting of sizes (values) of merged shares and a corresponding pro rata assignment of income and/or other benefits to specific purposes.

Endowment funds have various conditions that may be legally and/or ethically restrictive. These conditions define, limit, or influence matters such as: (*1*) form of asset-holding and degree of flexibility of management to shift investment; (*2*) ability to detach capital gain from parent principal, and to manage capital gain; (*3*) potential for use of yield and withdrawal (use) of principal. Upon analysis of conditions germane to each part of the endowment, funds may be classified (with any appropriate subclassification) as follows:

1. Restricted by donor's terms making principal inviolable (temporarily or permanently) and confining use of yield to specific purposes (rather than freeing yield for general endowment income).
2. Restricted by donor's terms confining use of yield to specific purposes and consenting only conditionally to use of principal: e.g., confining use of principal to specific purposes, or confining withdrawal of principal to appropriated capital gain.
3. Restricted by donor's terms confining use of yield to specific purposes, but open to unrestricted use of principal.
4. Restricted by donor's terms making principal inviolable, but open to unrestricted use of yield.
5. Restricted by donor's terms consenting only conditionally to use of principal, but open to unrestricted use of yield.
6. Open to unrestricted use both of yield and of principal.

The Trustees (corporation) may have acted at times as quasi donor, allocating unrestricted gifts, grants, or bequests to endowment or distributing assets from current funds to endowment. Funds (functioning as endowment) derived from this source may be similarly classified (by the Trustees' terms, if any). However, any restrictive conditions are at most ethical rather than legal obligations: that is, what the Trustees (corporation) have given to this preserve (endowment), the Trustees may take away. Ethical obligation restrictive of funds originating upon quasi donation is highly unusual, and if it exists, is probably fuzzy. Classificiation is therefore unimportant, except where a tie-in to donor's terms makes it essential or expedient: that is, where by reason of a previous mingling of donations and Trustees' appropriations, funds functioning as endowment are not legally, readily, or equitably separable. Funds functioning as endowment are usually open to unrestricted use both of yield and of principal.

Classification of endowment funds may be difficult, because: (*1*) disentanglement of a previous pooling or mingling of funds may present accounting and/or legal problems; (*2*) donor's terms or intent may be imprecise or ambiguous; (*3*) donor's old stipulations may be at some degree impractical educationally and/or financially, and therefore less binding than donor's terms imply. However, the typical endowment structure is probably such that the following three views are reliable, each indicating that the Trustees have a very substantial discretion and flexibility in asset-holding, management and appropriation of capital gain, and withdrawal (use) of principal:

1. Legal restraints are less binding than the Trustees commonly suppose.[10a]
2. Ethical obligations, at a decent consistency with legal duties, are less compelling than the Trustees commonly affirm.

[10a] See Cary and Bright, *The Law and the Lore of Endowment Funds.*

The specific purpose (restrictive stipulation) expressed in donor's terms may be out-of-date: that is, either obsolete or no longer viable. The financial capability of a fund may be inadequate to support the stipulated purposes. Yields (similarly to designated gifts) restricted as to purpose, but lacking an express directive that the equivalent expenditure be above some budget level, may fit regularly-budgeted uses (purposes), and therefore be unrestricted functionally but relevant pro forma to donor's purpose. Ethics in circumstances such as these are not Machiavellian when they are no more demanding than legal obligations, at points where the law avoids giving donor's terms a sacrosanct longevity or donor's intent a strict construction.

3. Within many endowments the magnitude of unrestricted funds is sufficiently large that the Trustees (together with management) can get an improved investment performance, and an improved endowment support of current operations, as feasibly as they could were the endowment fully unrestricted: that is, the magnitude of restricted funds may well not obstruct improvement; the flexibility may be sufficient to get about the same endowment diversification (balance among alternative asset-holding opportunities), and about the same comprehensive support, that would (should) be adopted were the endowment fully unrestricted.

This similarity of prospective results depends upon: (*1*) the magnitude of asset-holding that would (should) be required to serve aversion to risk (limiting capital gain in the investment performance) and aversion to appropriated capital gain (favoring build-up of endowment); and (*2*) the restricted funds that would be committed to relief of these aversions, but to a degree short of the magnitude required. and the supplemental margin of unrestricted funds also committed. But if the endowment were fully unrestricted, the additional (substituted) unrestricted funds would similarly serve the aversion to risk and the aversion to appropriated capital gain: that is, increase of unrestricted funds and decrease of restricted funds would not be necessary to get improved investment performance and improved endowment support of current operations.

VI. SHORTAGE OF CURRENT REVENUE

A persuasive case for increased endowment support of current operations (and for increased gifts support) must have effective documentation, such as: (*1*) an Urgent Needs Profile, setting out goals and priorities and emphasizing needs both in behavioral terms and in matching cost or financial terms; (*2*) the Budget for Current Operations, supplemented by the Plant Funds Budget for capital outlays; (*3*) a Financial Prospectus, (*a*) projecting gifts, grants, bequests, etc., and the allocation of these receipts, (*b*) extending budget estimates to future years and situations, and (*c*) outlining financial alternatives and potentials. The evidence and analysis must indicate any present and prospective shortage of current revenue, relative to the need for revenue and the supportive strength of sources other than endowment.

In a particular case (college) the shortage of current revenue is a situation proportionate to several major determinants: feasibility of needs, supportive strength of revenue sources, reduction of operating expense, and emergency financing. The ongoing and expanding need for adequate resources in current operations confronts these limits.

Feasibility of needs.—An Urgent Needs Profile, a Financial Prospectus, indeed any workable conception of shortage of current revenue, should acknowledge that educational quality, like other good things, involves benefits at sacrifice. At any quality level, compared with an alternative lower level, the educational performance requires increased costs and, correspondingly, increased financial coverage or else sacrifices some other place. Any selective improvement of educational quality, or extension of educational service, similarly involves benefits at sacrifice. The "desirable" should not be confused with the "feasible." These financial realities enjoin every college to perceive limits beyond which it will not, because it cannot, have "better" education and/or "better" style of life.

Planning and budgeting typically look upward to an elevation of achievement, prospectively alongside "inflation." But if education at improved quality is not a feasible alternative, the college may have to set its sights on education at maintained quality or at another workable minimum. In a particular case the ongoing and expanding need for adequate resources has (should have) this realistic orientation, prompting attitudes conducive to attainable goals and priorities. Prudent attitudes temper the upward pressures on operating expense and therefore tend to mitigate the expansive pressures on operating-expense/operating-revenue gaps.

Pricing education at charges below cost.—Conventionally, on grounds of general welfare (social values), state colleges and universities offer education at low tuition and related fees: that is, at charges not only below the cost of serving the student, but also sufficiently inexpensive to be (seem) reasonably akin to the historic free tuition in public education. On grounds of personal benefit (private advantages), together with shortage of state appropriations, students now pay some fraction of educational cost, though public support carries the bulk of this cost burden.

Students at four-year public colleges typically (except in the least costly Southeast) pay room and board expenses ranging (1968–69 academic year) from about $800 to above $900, the West and Southwest having the high average expense and the Northeast and the Midwest having lower averages. Students at four-year private colleges pay more, averaging (all regions combined) more than $100 additional. Tuition and related fees for the full-time student in private colleges average out at about one and one-half (150%) times room and board expense. But tuition (in-state) and fees in public colleges average out at less than one-half (50%) of room and board expense.[11]

Private colleges and universities usually set their charges below cost, though at a cost coverage substantially larger than the typical fractions of cost demanded of students in the pricing of public education. Private colleges carry on this pricing to attract enrollment, to promote selective composition (talents, wealth and income positions, and other diverse or uniform characteristics) of the student body, and to advance institutional welfare (college preferences), concerning the college's special responsibilities and its own being (posture and strength) as a going concern.

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[11] See *Handbook*, for National Merit Scholarship Qualifying Test participants, Spring 1969 (Science Research Associates, Inc., 1969), pp. 23–25.

Pricing private education at charges below cost therefore represents several adaptations: (*1*) competitive response to low tuition and related fees for public education; (*2*) competitive response to charges, quality of services, and other inducements offered by private colleges, especially by rivals for similar student characteristics; (*3*) adjustment (response) to student inability to pay full cost coverage, where the college seeks selective composition of the student body but confronts short supply of students who have ability to pay as well as preferred qualifications; (*4*) reliance on revenue derived from gifts and revenue from endowment to sustain (cost coverage) a substantial margin of educational quality, of scholarship assistance, and/or other requisites of institutional welfare (college preferences). Decisions regarding charges involve (*5*) adjustment to projections of demand (price alternatives and related enrollments) and operating expense.

These purposes and adaptations are the major determinants of pricing at charges below cost. They also restrict a private college's upward range for annual increase (e.g., the typical 5 percent annual increase) of tuition and related fees or for an addition to a comprehensive charge: that is, the potential for elevation of charges as indicated (initial approximation) by the upward movement of personal (disposable) incomes.

A private college's ability to establish an increase of charges, or perhaps to come closer to charges at full cost coverage, is closely related to the after-taxes purchasing power of persons and households corresponding (wealth and income terms and location) to the background of the student body. Any upward movement of financial (scholarship, grant-in-aid, loan) assistance from governmental or other external sources, or any significant action by public institutions increasing their charges and narrowing the differential (expensiveness) between public and private education, is a collateral influence that also enhances the opportunity for increase of charges. Pricing close to full cost coverage tends to be easiest, however, where education is streamlined and a clientele (students) has high ability to pay but low admissibility elsewhere or other immobility.

The pricing of education at charges below cost may well allocate resources inefficiently.[12] This practice involves collective (though not collusive) behavior from which the individual private college acting alone cannot extricate itself. Insofar as a college has either misjudged or underexploited its opportunity to increase tuition and related fees, it may move closer to charges at full cost coverage. But the prevailing opinion among those who do the pricing is that significant independent (countervailing) action, beyond the relatively high expensiveness and typical annual increases of tuition and related fees in private education, is too risky financially. Further, the prevailing belief is that the college should (institutional welfare and/or social values) price education at charges below cost. In a particular case the ongoing and expanding need for adequate resources endures this constraint on revenue from students.

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[12] See Theodore W. Schultz, "Resources for Higher Education: An Economist's View," *Journal of Political Economy*, 76 (May/June 1968), 327–47.

Diversion of gifts from operating revenue.—Competitive societal demands may well make sharp inroads on future enlargements of the gifts inflow to private colleges. Further, within a college, gifts are subject to donor's stipulation or the Trustees' decision as to use. These receipts (or the equivalent) may go for support of current operations or to an alternative use such as endowment or capital outlay. Operating revenue derived from gifts may therefore be cut back in favor of distribution to endowment and/or plant funds (immediate source of capital outlay for construction projects).

Competitive internal demands on financial resources.—Plant funds policy may, and usually does, sacrifice operating revenue in favor of capital outlay, increasing the burden of closing the operating expense/revenue-from-students gap. This sacrifice occurs upon distribution of gifts directly to plant funds and/or upon transfer of current funds to plant funds. Distribution directly to plant funds diverts gifts from current funds (initially, from current funds revenue) and therefore from current operating revenue. Assignment of current funds revenue (initially, transfer of current funds) to plant funds reduces the current revenue for operations.

Investment is another institutional performance that puts a competitive demand on financial resources. Investment policy, though beneficially seeking the "best" performance, drains yield from the financing of current operations. Unless the drainage of yield is offset, it usually increases the burden of closing the operating-expense/revenue-from-students gap: that is, it reduces the supportive strength of revenue sources.

Instability of revenue.—Instability of revenue also increases the burden of closing the operating-expense/revenue-from-students gap. Gifts (receipts without regard to designation) and operating revenue derived from gifts are subject to upward or downward escalation from numerous influences apart from the activity and quality of the fund-raising (gifts) effort. Similarly, all other revenue flows are exposed to variation, a hazard (at times a harsh fact) springing from influences outside the college and decisions within.

Misestimate in budgeting.—Alongside the instability of revenue, another hazard (at times a harsh fact) affects the adequacy of resources for current operations: that is, overestimate of revenue to varying degrees and/or underestimate (and perhaps undercontrol) of expenditure. Actual revenue flows during a fiscal year may fall short of budget projections (forecasts). But actual expenditures and commitments occur on the projections.

Resistance to reduced expenditures.—Reduction of operating expenditures (mainly on lowered budget projections) counteracts shortage of current revenue but usually within narrow limits: that is, (*1*) where a margin of reduced expenditures enforces rearrangements of teaching and learning without endangering educational quality but at economy of time to faculty and students, and (*2*) where the burden of retrenchment is on "style of life" without endangering the reciprocity of good cultural quality and good academic quality. Indeed the reduced expenditures may be conducive to educational improvement in each case. But (*3*) where reduction of operating expenditures is a gross substitute for inadequate supportive strength of revenue sources, it is an option adverse to education at improved quality or at maintained quality.

Resistance to reduced expenditures has a protective, perhaps a hardening, effect on shortage of current revenue. Yet, unless a college must set its sights on education at a minimum less than maintained quality, reduction of expenditures is not a highly promising weapon against a shortage. Both "inflation" and the prevalence of urgent needs and innovation deter this means of cutting back the operating-expense/operating-revenue gap.

Emergency financing.—Emergency borrowing and emergency drainage of endowment are measures sustaining shortage of current revenue. But they are poor expedients at once onerous financially and unconstructive toward sound adequacy of resources for current operations. The Trustees may reluctantly endorse borrowing (usually the preferred expedient) on grounds such as "marking time" in anticipation of enlarged revenue from students, donors, or other sources, or "smoothing transition" to reduced expenditures. If they endorse emergency withdrawal of endowment principal, the Trustees may well require demonstrable advantage of this alternative over borrowing, as well as demonstrable inability of the college to get emergency relief (revenue) from gifts on special appeal to alumni and other donors.

Need for optimum supportive strength of revenue sources.—Shortage of current revenue is a situation responding to several major influences; feasibility of needs; priving education at charges below cost; inadequate supportive strength of revenue sources; resistance to reduced expenditures; and emergency financing. This situation differs (local characteristics and dimensions) from one particular case (college) to another. It demands of most colleges the remedial action that achieves optimum supportive strength of revenue sources.

VII. PROVISION FOR THE PRESENT *v.* PROVISION FOR THE FUTURE

Shortage of current revenue, compelling remedial action, shows up in the operating-expense/operating-revenue gaps. But (*1*) reduction of operating expenditures, cutting back a gap, is not a frontline measure. Although (*2*) increased revenue from students must be the mainstay of resources in current operations, it must confront the limitative realities of pricing below cost, and prospectively it is insufficiently remedial. Further (*3*) increased yield from endowment is adverse to the best investment performance; that is, to investment favoring capital gain, unless the best performance happens to require increased yield.

Optimum supportive strength of revenue sources depends upon both (*4*) increased revenue derived from gifts and (*5*) comprehensive (yield and appropriated capital gain) support from endowment. In the fund-raising (gifts) effort, education at improved quality is a viable magnet drawing gifts, grants, and bequests to the college. Educational improvement helps generate the capacity to finance it. Reduced operating expenditures at the sacrifice of educational quality are therefore at the sacrifice of fund-raising (gifts) productivity and at the sacrifice of developmental capacity.

In the investment performance, where policies are conducive to increased investment return combining yield and capital gain, the sacrifice (drainage) of yield may well be at an amount (margin) sufficiently large to be equivalent to budget-balancing capacity: that is, if the portfolio were realigned to get an increased proportion of high-yield securities. The typical posture of the Administration is that capital gain should be systematically appropriated to the financing of current operations, as a compensatory substitute for the budget-balancing resources given up. This matter-of-fact plea is not, however, the breadth and depth of the persuasive case for systematic comprehensive (yield and appropriated capital gain) support of current operations.

Provision for the future.—The essential case for the build-up of endowment is clear: (*1*) that the build-up will elevate the future base of investment performance and its potential for support of future operations; (*2*) that the build-up is currently urgent, by reason of the strong prospect of ongoing "inflation" and the need to offset it currently while offsets (acquiring and keeping capital gain) are available. A related contention is (*3*) that systematic withdrawal of principal takes substantial pressure off today's fund-raising (gifts) effort and today's economizing effort, and therefore takes substantial pressure off the "present" to make provision for the present.

Provision for the present.—But the reasoning against any appropriation of capital gain overlooks too many aspects of the present: that is, the requisites of adequate financial provision for the present, and the inevitable consequences for the future in its historical continuity out of the present. On the urgency to provide adequately for the present, the following determinative comments are worth emphasis:

1. Colleges and universities seriously need "now" the financial capability to countervail the quality-eroding influences of current "inflation" that threaten not only service to the present but also service to the future.

2. Colleges and universities seriously need "now" the financial capability to countervail the quality-eroding influences of a current "plateau of giving," a leveling-off (after additional giving at roughly the pace of "inflation") in donations to private colleges and appropriations to public institutions. This situation typically follows an upswing of giving; but currently it is interlocked with the rising demands on private and governmental sources of funds to meet other welfare urgencies, the overwhelming urban necessities, and the costs of attending to "power" in the world today, yet also to meet the urgent needs of primary and secondary education.

3. Colleges and universities seriously need "now" the financial capability to countervail the quality-eroding, indeed the quality-stagnating, consequences of any cultural and technological lag: that is, any substantial inability to meet the modern demands of sociological, technological, and subject-matter innovation in higher education.

Provision for both the present and the future.—Comprehensive (yield and appropriated capital gain) support of current operations is a compromise between provision for the present and provision for the future. But the apparent conflict is deceptive.

The strength of the present in its historical continuity with the past represents many past upgradings of educational quality financed by innovative income-coverage of the increased expense. The strength of the future in its historical continuity out of the present will similarly represent many present upgradings of educational quality financed by innovative methods, such as comprehensive (yield and appropriated capital gain) support of current operations. But more than that, the educational strength of the future depends upon having in the present the great educational strength out of which to get the wherewithal of historical continuity. Provision (service) for the present is therefore provision (service) for the future. The present makes the future viable.

A Note on State and Local Financing of Higher Education

Selma J. Mushkin*

INTRODUCTION

This note summarizes background information on State and local finances of higher education. State and local finances is defined here as financing which calls on the general taxpayers of the State and local government to contribute through compulsory general levies for the education of students in the colleges and universities. The information is presented in the form of answers to the following frequently posed questions:

1. What are the claims of student higher education on State and local finances?
2. Have the States and localities simply provided funds to accommodate the rise in demand for higher education, or have they provided funds as well for improving quality of education?
3. What were the tax consequences of the enlarged demands for "college going"?
4. What are the most urgent problems facing States in the financing of higher education?
5. What are the future requirements for the State-local monies?

1. What are the claims of student higher education on State and local finances?

The financial accounts do not routinely provide a separate accounting of expenditures for each of the major functions of colleges and universities—student higher education, research, and public services—and do not show the sources of funds for each of these functions.

For purposes of answering the question on State and local general revenues going to support student higher education, it was necessary to estimate both the expenditures and sources of funds from the data that are available.

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*The author is Program Director, State and Local Studies, The Urban Institute. She is indebted to David Brodsky of the Urban Institute for his comments on an earlier draft of this note. Errors in fact, or interpretation are fully the author's responsibility.

As used here, it must be noted that student higher education includes expenditures for instruction (and departmental research) and the portion of expenditures for general administration, libraries, and maintenance of physical plant that is attributable to instruction. Accordingly, from the category of expenditures typically reported in financial accounts, namely "educational and general," the following items have been excluded: organized research, extension, and public services, and also that part of administrative, plant-operation, and library services that is attributable to organized research and public services. Expenditures for auxiliary services, scholarship aid, and capital outlay are also excluded.

The amount estimated for 1961–62 and 1965–66 as student higher education expenditures and receipts of *public colleges and universities* by source for this purpose are shown below:

[In millions]

	1961–62	1965–66
Student higher education expenditures	$1,792	$3,784
Student higher education receipts	1,792	3,784
Tuition	378	794
Federal payments	141	480
State and local government funds	1,216	2,411
Endowment earnings, gifts, other	84	99
Net receipts from organized activities	−27	([1])

[1] Not available.

The tuition amount shown excludes tuition for nondegree credit courses estimated at 20 percent of the outlays for extension and public services. For 1965–66, it includes tuition set aside for plant funds, since we view these tuition payments as those made for teaching services.

Federal payments are those exclusive of funds for organized research and an adjustment has been made for endowment income and private gifts and grants going into separately organized research.

A combination of estimates suggests the following changes in state and local funds for student higher education in public colleges and universities as defined above:

	In billions
1957–58	$1.0
1961–62	1.2
1965–66	2.4

Thus, according to these estimates, there was about a $1.2 billion increase in State and local finances for student higher education over the last four-year period, or an average increase of about $300 million a year.

The amount of State and local government current fund revenue for public institutions, as reported routinely in the U.S. Office of Education statistics, are as follows:

[In millions]

	Total, State and local	State	Local
1957–58	1,255	1,129	126
1961–62	1,825	1,641	184
1965–66	3,238	2,927	311

The above figures on State and local funds, as indicated earlier, include funds for research, for extension and public services, and for such organized activities of colleges and universities as laboratory schools, agricultural experiment services, medical services in university hospitals.

In the one year, 1965–66, the U.S. Office of Education asked for information on source of funds by purpose, but did not separate out funds used for administration and other "overhead." State funds for public colleges and universities for all educational and general purposes other than organized research and organized activities related to education departments were reported at $2,643 million, local funds at $295 million, making a total of $2,939 million, as compared to the $3,238 million figure shown in tabular form above.

2. Have the States and localities simply provided funds to accommodate the rise in demand for higher education, or have they provided funds as well for improving quality of education?

By and large, State and local finances of public colleges and universities have not been enlarged sufficiently to facilitate the raising of the quality of education.

A recent report to the President on *Toward a Long-Range Plan for Federal Financial Support for Higher Education*[1] indicates that State and local support for public institutions of higher education rose faster than enrollments:

Average annual percentage increase, current income per student, 1959–60 to 1965–66

PUBLIC COLLEGES AND UNIVERSITIES

	Percent
Total	4.0
State	3.4
Local	2.8

The increases in funds per student, however, has to be viewed against a basic growth rate that could keep quality and education from being eroded by less than competitive salary increases for faculty. Such a basic increase would take account of salary increases that would be competitive with other wages and salaries and also of higher prices for supplies, equipment, and so forth.

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[1] U.S. Department of Health, Education, and Welfare, January, 1969.

It is estimated here that such basic increases would be at least 3.2 percent per year for the period 1959–60 to 1965–66. If faculty salary increases of 5 percent per year were built into the basic figure, as proposed by the American Council on Education, the basic growth would be 4.1 percent for this period.

In developing the rough estimates of basic growth required to maintain quality of education per student, it was assumed that salaries account for 75 percent of student higher education expenses, that general prices rose 1.5 percent over the period, and that wage and salary payments rose 3.7 percent.

Comparison of the actual increases in State and local funds over the period with the basic rate suggests that State finances of public colleges and universities rose only slightly more than the minimum required to maintain quality, and significantly less than the minimum rate of 4.1 percent. Increases in local funds per student were substantially below that required to maintain quality.

Expansion in community colleges and 2-year institutions is itself an indication of the lowering of the levels from *university standards*, in the course of opening access to a vastly enlarged number of students.

3. What were the tax consequences of the enlarged demands for "college going"?

State government, when confronted with the problems of accommodating the mounting census of young persons of college-going age, responded in several ways. The States (1) increased their general revenue contribution to student higher education in public colleges and universities, as indicated earlier; (2) provided state scholarship support for students in private colleges and universities; (3) developed cooperative programs with local governments for community and junior, or 2-year colleges.

On the State governments and their public institutions fell a good share of the responsibility for providing additional places to accommodate the vastly increased number of 18 year olds. About 4.5 times as many new places for freshmen were created in public colleges and universities as in private ones. Between 1957 and 1967 when freshman enrollments for degree credit rose some 715,000, 590,000 of the increase was in public colleges and universities.

The $1.4 billion increase in State and local funds for student higher education in public colleges and universities during the period of 1957–58 to 1965–66 could not be met simply out of the growth in State revenue accompanying economic expansion; higher tax rates or additional tax levies, or both, were required. Approximately 10 percent of the total increase in State tax collections during the period were allocated to growth in costs of teaching of students in the public colleges and universities. These increases in State funds were the equivalent of about 55 percent of the rise in personal income taxes in the States, and the equivalent of about 35 percent of the rise in general sales taxes over the period. (State and local funds for public colleges and universities are shown as a percent of total State and local own revenue in Table 1.)

TABLE 1.—*Income from State and local governments and from States only for institutions of higher education as percentage of State and local own revenue and of State own revenue, 1965–66.*

[In percent]

	State and local	State
United States	4.79	8.79
New England	2.46	5.13
Maine	3.63	6.68
New Hampshire	4.13	9.90
Vermont	4.81	7.58
Massachusetts	1.73	4.01
Rhode Island	3.86	7.04
Connecticut	2.54	4.83
Mideast	3.25	6.41
New York	3.73	7.00
New Jersey	1.97	6.06
Pennsylvania	2.79	5.27
Delaware	3.50	4.89
Maryland	4.06	6.95
District of Columbia	.44	0
Great Lakes	4.94	9.75
Michigan	5.84	10.51
Ohio	2.90	5.63
Indiana	5.40	10.30
Illinois	5.58	12.79
Wisconsin	5.10	8.64
Plains	5.31	10.38
Minnesota	4.03	7.69
Iowa	6.12	12.41
Missouri	5.55	10.33
North Dakota	5.98	10.63
South Dakota	6.99	15.28
Nebraska	4.97	12.61
Kansas	5.70	10.59
Southeast	5.07	8.13
Virginia	3.88	7.08
West Virginia	7.02	10.75
Kentucky	6.69	9.88
Tennessee	4.45	7.83
North Carolina	4.81	6.89
South Carolina	4.38	6.15
Georgia	4.36	7.37
Florida	4.78	9.54
Alabama	5.05	7.94
Mississippi	5.82	8.11
Louisiana	6.07	8.24
Arkansas	5.94	9.10
Southwest	5.92	10.38
Oklahoma	5.45	8.73
Texas	6.03	11.33
New Mexico	5.60	7.64
Arizona	6.23	10.64
Rocky Mountain	6.54	12.19
Montana	5.81	12.42
Idaho	7.94	12.98
Wyoming	7.71	5.33
Colorado	5.87	11.73
Utah	7.18	12.09
Far West	6.36	10.90
Washington	6.94	11.17
Oregon	6.86	12.69
Nevada	3.59	7.60
California	6.30	10.75
Alaska	4.83	7.03
Hawaii	6.26	8.82

Source: Computed from U.S. Department of Health, Education, and Welfare, Office of Education, *Financial Statistics of Institutions of Higher Education;* U.S. Bureau of the Census, Division of Governments, *Governmental Finances in 1965–66.*

In addition, a number of the States adopted a policy of student support in both private and public institutions to relieve the pressures somewhat of the enlarged demands for student placement on the public institutions. State funds for private colleges and universities substantially more than doubled during the six years 1959–60 to 1965–66, but only from $36 million to $85 million. State funds for all purposes reported in the current income accounts of private institutions in 1965–66 represented only 1.6 percent of the total income of those institutions, and was clearly not an important source of their funding.

In 1965–66, thirty-three States reported no State funds for private university operations—research, public services, or student education. By way of contrast, in four States, State funds to private universities exceeded $500,000. These States, arranged in order of the size of the amount of revenues received by private universities from State government sources, were New York State—$39.4 million; Pennsylvania—$28.1 million; Florida—$1.5 million; and Illinois—$0.8 million.

State scholarship support that comes to private institutions in the form of tuition payments has been increasing. Aid from State governments to students enrolled in private institutions amounted, however, to only $8.6 million in 1966–67. (The comparable figure for aid to students in public institutions was $20.8 million.)

In the State response to demands for college going, local governments were involved in a way that marks a change in the institutional structure and financing of higher education. This change was intended to bring the college to the student and thus lower the costs of college going. It was also intended to broaden the opportunities to new groups of students either as 2-year terminal education or as a step to university education.

Well over half of the added local funds reported as current income went to 2-year public colleges. Over the Nation as a whole, about one-third of the current income of these 2-year institutions comes from the local governments, with the State governments contributing out of general revenues approximately an equal share, indicative perhaps of State grants to local governments for the operation of these institutions.

The carrying over to higher education of a pattern of financing elementary and secondary education poses sharp issues for the future. It places new burdens on the already overloaded local property tax—a source of tax dollars that has created serious land use problems on the one hand, and difficulties of maintaining quality levels of education on the other.

4. What are the most urgent problems facing States in the financing of higher education?

The period 1958 to 1966 marked the sharpest incline in the number of young persons of college age. The autumn of 1965 was the peak with one million additional 18 year olds, compared with the number of five years earlier. In the subsequent academic years, the number of 18 year olds dropped off and will continue to be below the 1965 peak for almost five years. The colleges and universities—both public and private—thus look back at the past crisis in freshman enrollments. There is no reason to expect, however, that total enrollment will not climb above the 1965 level, but only that the population pressures on enrollment have abated.

With the accommodation problem met, the issues are altered. Concern centers on these three problems:

1. reaching greater parity of educational opportunity for young persons from low income families,
2. broadening and strengthening graduate education and education for the professions, and
3. maintaining a varied, strong, and free academic community.

Each of these three problems has a financial counterpart. The means by which education is financed and the incentive structure built into those means can determine whether the problems are met with reasonable success in the years ahead.

Greater parity in educational opportunity.—As indicated above (question 1) student tuition and fees cover 21 percent of the student higher education expenditures in public colleges and universities. A sizeable share of the costs is subsidized either through State and local finances, or from gifts, grants, or other sources.

One immediate set of issues is the appropriate share of public higher education that is to be subsidized, for what types of students, and how (that is, through what mechanisms).

Studies of the characteristics of college students point uniformly to the greater opportunity that young persons from higher income families have in gaining access to and also, to some extent, in completing their college education. These study findings persist despite the wide variations in tuition costs among the different types of institutions of higher education and the diversity of State policies with respect to student charges in public institutions.

In attempting to achieve greater parity, it must be recognized that costs to the student in going to college include not only tuition and fees, but also the extra costs of room, board, and travel, and the costs of the earnings that they might command if they were not engaged in studies. The methods of achieving greater parity include, on the one hand, a raising of the cost (or reducing of subsidies) of college going for those with high incomes, and on the other, providing scholarships or even student wages to those with low incomes, plus added educational services that can dampen the effects of prior educational deficiencies.

Generally tuition and fees are not differentiated within a single college and university by economic ability. The doctrine of "payability," so customary in medical care, has not been applied in higher education. Scholarship aid, student loans, or tuition-free education has been the pattern, with income tests applied for both scholarships and loans.

The U.S. Office of Education has compiled information on tuition fees in public universities for full-time undergraduate resident degree credit students. The data compiled show tuition levels in public universities at about one-quarter that in private universities.

Tuition and required fees per full-time undergraduate student in universities

	Public	Private	Ratio, private to public
1957-58	$205	$798	3.89
1960-61	250	994	3.98
1962-63	268	1,149	4.29
1964-65	298	1,297	4.35
1966-67	360	1,456	4.04

The data on tuition in public colleges and universities set alongside information on characteristics of students enrolled suggest that there is reason to question current practices, if greater fairness among income groups is to be achieved. However, the data available do not provide guidance on the full impact of substantially higher charges on opportunities for study of those that are especially qualified by prior educational achievements. A price would be paid by the Nation if a substantial number of specially talented students are lost to higher education by such policies. Concomitant steps could be taken to reduce such loss by, for example, a broadened loan program that carries with it no income limitations on eligibility and that is liberal enough in amount to meet the varying student needs.

A real opening up of access to higher education for those from low income families on a parity with other economic groups suggests higher and more financial incentives for college going. Scholarship aid, work-study programs, tuition-free studies are various methods that are used. But possibly wage payments and injection of supporting services are also needed. Disparities in prior educational experience of students, principally black students, have led to the initiation of special programs such as Talent Search and Upward Bound through which efforts are made to search out young persons who could qualify for higher education and to equip them for a college program of studies. But the disparities in prior schooling, learning, and cultural experience in the home, require a much larger injection of resources and training than has been considered heretofore. Black separatism in the colleges is one signal of the prior underemphasis on the needs for supporting resources during the course of the college program—that, or a clearer recognition of a necessary lowering of educational output in the absence of intensive supports. Students will require incentive for such intensive work but little discussion now goes on about the funding for such supporting services and incentives.

Both the redistributive objectives that are of concern and the externalities that flow from greater parity point to substantial national government financing of aids and supports for students from low income families and for underwriting of loans for those who are especially talented without regard to income.

Graduate and professional education.—Financing of graduate education has come to be shared by Nation and State through fellowship aid, research grants, and other aids for development of graduate education centers.

An ever enlarging role has been placed on institutions of higher learning in this age of rapid scientific and technological progress. The gains made have created new demands for services of highly trained professional manpower in business, engineering, medicine, and in the educational establishment itself. Responsibilities for meeting these manpower needs of the Nation and the States fall on the graduate training institutions. And at this time, there is a larger pool than ever before of college graduates that seek opportunities for such training.

The number of graduate students has increased far more than undergraduates, with the largest percentage rise in graduate studies for women. Almost 300,000 graduate students were enrolled in 1957; about 6 out of 10 were part-time students. By 1967 the number approached 700,000—a number that will almost double in the decade ahead.

The projected increase in graduate education requires a substantial enlargement both of facilities and of services. In the financing of this expansion, the cost characteristics of graduate studies, the benefits from such studies, and the effects of alternative methods of financing must be considered. Concentrations of Federal research support that helps to both finance and carry out graduate education need to be assessed so that imbalances among institutions can be corrected.

Approximately 65 percent of State funds spent for all public higher education go to the State universities; the remaining 35 percent go to public 4-year and 2-year colleges. Yet State financing of graduate education poses repeatedly a number of difficult policy questions about the appropriateness of use of State general revenue for: (1) students from out of State—with resulting tendencies to restrict admission and weaken the educational gains from more balanced geographic distribution of students; (2) students who will move out of State on completion of their studies; (3) development of both a research base and talented manpower for the *nation*; and (4) students from higher income groups who will, on graduation, further enlarge their earnings.

Countervailing considerations include the importance of graduate and professional education for—

(1) the economic development and growth of the State by providing resources that can attract and maintain new electronics and other expanding industries,

(2) fulfillment of the State's responsibilities for basic services to the public, such as health care, through manpower development,

(3) attraction of funds, both Federal and foundation, for research and the concomitant of more ample resources that can attract highly competent faculty for higher education, and as a base for improvement in elementary and secondary education as well.

Graduate education tends to be more expensive than undergraduate. Student tuition and fees represent only a small share of the costs of education; some reductions in the subsidies are possible, especially if loan programs are broadened. But costs of graduate education to the student include far more than tuition and fees, and substantial increases in tuition could create a barrier to graduate studies for many highly talented young persons. We need far more information than is now available about the levels of tuition and fees that would keep access open to those talented young persons, especially when buttressed by loans and grants.

National fellowship and institutional support for graduate and professional studies that can permit the States to reduce their subsidization of graduate studies would appear to be more in concert with the national characteristics of the specialized professional and technical labor markets than current financing practices. States could then pursue, if they so elect, a tuition and charge policy that takes fuller account of the private earning gains attributable to such graduate education, without endangering or weakening their higher education institutions and access to studies there.

Academic freedom and a strong higher education community.—The way in which higher education is financed and the way in which decisions are made about the allocation of those financial resources that are available will determine whether higher education in the United States can continue to be strong, within a varied pattern of many institutions, both private and public, each with its own defined mission. Added Federal financial support is needed, as will be indicated later (question 5). The added Federal subsidies that are required heighten traditional concerns about controls on educational expenditures and relation to academic freedom. And those concerns are enlarged by the reactions to the thrust of students for "relevance and basic values." The reported response of some State legislators to student unrest on the campuses is a hiking of tuition and a reduction in university appropriations. The response in the U.S. Congress has been the imposition of qualifying conditions on student aid, and further restrictions are currently under debate.

5. What are the future requirements for the State-local monies?

The recent report to the President projects 1975–76 expenditures for higher education at $40 billion, an increase that would bring higher education to 2.5 times its 1965–66 level. Expenditures for student higher education in public colleges and universities may be expected, generally consistent with the $40 billion aggregate, to exceed $15 billion. Even if the total attained were only 3 times the 1965–66 level of student higher education expenditures, it would be $11 billion. An expanding share of new college places clearly is likely to be provided in public institutions rather than private ones.

The distribution of the $11 billion by source of funds is shown below, first assuming that relative shares remain unchanged from 1965–66, and second assuming that a large share of the funds is federally financed.

Student higher education receipts, 1975–76

[In billions]

	Illustrations	
	I	II
Total	$11.0	$11.0
Tuition	2.3	2.5
Federal payments	1.4	2.8
State and local government funds	7.0	5.4
Endowment earnings, gifts, and other	.3	.3

Even with the assumed doubling of the Federal funds, the States could not raise their portion of the finances without new taxes or higher tax rates. Or stated differently, the rate of growth in expenditures exceeds the rate of responsiveness of State revenues to economic growth. To avoid such higher taxation for public education, the Federal Government's funding would have to increase an additional $1.2 billion.

At present, over the Nation as a whole less than 1 percent of personal income is devoted to State and local subsidies for public higher education. Variations among regions and States continue to reflect the traditional geographic emphasis on public education in the Western region and on private colleges and universities in New England and the Midwest, despite the breakthroughs in public higher education in some of the Eastern Seaboard states since 1957–58 (Table 2).

TABLE 2.—*Income from State and local governments for institutions of higher education, as a percent of personal income*

	1965-66	1957-58
United States	0.6	0.4
New England	.3	.2
Maine	.5	.2
New Hampshire	.4	.3
Vermont	.7	.5
Massachusetts	.2	.1
Rhode Island	.4	.2
Connecticut	.3	.2
Mideast	.4	.2
New York	.5	.2
New Jersey	.2	.1
Pennsylvania	.3	.2
Delaware	.5	.2
Maryland	.5	.3
District of Columbia	.1	.1
Great Lakes	.6	.4
Michigan	.7	.5
Ohio	.3	.2
Indiana	.6	.4
Illinois	.6	.3
Wisconsin	.7	.4
Plains	.7	.5
Minnesota	.6	.5
Iowa	.8	.6
Missouri	.6	.3
North Dakota	1.0	.9
South Dakota	1.0	.6
Nebraska	.6	.5
Kansas	.8	.6
Southeast	.6	.4
Virginia	.4	.3
Southeast—continued		
West Virginia	.9	.5
Kentucky	.8	.3
Tennessee	.5	.3
North Carolina	.6	.4
South Carolina	.5	.4
Georgia	.5	.3
Florida	.6	.3
Alabama	.6	.4
Mississippi	.8	.6
Louisiana	.9	.7
Arkansas	.7	.6
Southwest	.8	.5
Oklahoma	.7	.5
Texas	.7	.4
New Mexico	.9	.6
Arizona	.9	.5
Rocky Mountain	1.0	.6
Montana	.9	.9
Idaho	1.2	.6
Wyoming	1.3	.7
Colorado	.9	.5
Utah	1.1	.7
Far West	.9	.5
Washington	1.0	.6
Oregon	.9	.6
Nevada	.5	.4
California	.9	.6
Alaska	.7	.3
Hawaii	1.0	.3

PART VI. FINANCING HIGHER EDUCATION IN THE 1970's

Section B

STRATEGIES FOR FEDERAL FINANCING OF HIGHER EDUCATION

Social Goals and Federal Support of Higher Education—the Implications of Various Strategies

Alice M. Rivlin and *Jeffrey H. Weiss*[*]

WHY SO MUCH INTEREST IN FEDERAL FINANCING?

The question of Federal aid to higher education—how much and what kind—has become a hot subject for debate. Meetings of higher educators now seem to concentrate on two subjects: student unrest and Federal aid. Committees and commissions without number have taken positions on the desirable level and nature of Federal aid to higher education. The Carnegie Commission on the Future of Higher Education felt the subject of Federal aid so urgent that it announced a position in its first report. The debate has waxed emotional and proponents of different types of aid have attacked each other vociferously.

Why all the fuss? We do not have a Federal system of higher education and no one thinks we should have. Federal funds flowing to institutions of higher education have risen in recent years, but are still directed mainly to support of research. Excluding organized research, Federal funds account for only about 5 percent of the current income of higher education institutions. Moreover, Federal support tends to be concentrated in major universities. Most institutions see very little Federal money. Federal loans and grants to students have also risen, but students and their families still pay most of their college expenses themselves.

There are, we think, two reasons for the current interest in the whys and hows of Federal aid to higher education. First is the widespread feeling in the higher education community that a financial crisis is impending. Whatever its basis, this feeling is real. One has only to talk to a group of college administrators to realize how uneasy they are about the financial future of their institutions. Most of them have managed over the last several years to increase the income of their institutions dramatically. Many have grown in size, most have raised tuitions or obtained greatly increased funds from private giving and State and local sources. But they are uneasy about the future. They are afraid that continued increases in support from State, local and private sources will not be forthcoming. In the face of these uncertainties higher educators have turned to the Federal Government for a possible long-run solution to their financial problems—despite the fact that military pressures on the Federal budget and congressional reactions to student unrest make major immediate increases in Federal support for higher education seem unlikely.

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A second reason for the high level of interest in Federal financing of higher education is that the Federal financing question is a convenient rubric for discussing more basic questions of public policy. As a nation, we have not come to an agreement on (a) what kind of a higher education system we want, (b) who should go to it, and (c) who should pay the bill. Discussing the size and form of Federal aid provides a way of focusing on these more basic questions. For example, the argument between those who favor a loan bank for students, such as that proposed by Jerrold Zacharias, and proponents of institutional aid, such as the Miller Bill, is not fundamentally a debate about Federal aid. It is a debate about who should go to college, and how the burden of paying for higher education should be shared between the student and the public.

In this paper, we would like to clarify the various options open to the Federal Government in financing higher education by relating these to the more basic questions. The paper, first, describes the important characteristics of the higher education system we now have and then turns briefly to the future—what sort of a system we would like to have. It then examines alternative ways of sharing the cost between students, parents and the public, and finally turns to the role of the Federal Government, as contrasted with that of State and local government. The focus is on financing undergraduate education in general, *not* on the special problems of graduate education and research.

WHAT KIND OF A SYSTEM DO WE HAVE NOW?

Perhaps the most striking characteristic of American higher education is its structural diversity. We have tiny colleges and mammoth, multi-campus universities. We have public institutions and private institutions, and a few that are both. We have some that are expensive and some that are nearly free. We have some with exacting intellectual standards and some with almost no standards at all. Moreover, the system is growing and changing with new institutions opening up every week.

The following three statements summarize some facts about American higher education which need to be kept in mind.

1. A Lot of People Go to College, But Opportunities Are Still Far Greater for the Rich Than for the Poor

In most of the world, higher education is restricted to a small elite, but in the United States more than a third of all young people get some higher education and those who have demonstrated academic ability in high school have a good chance of going to college. Nearly 70 percent of our 1960 high school graduates who scored in the top 40 percent on achievement tests entered college within five years of high school graduation. Nevertheless, a student from an upper-income family has a much greater chance of going to college than a student from a low-income family—even if the two have substantially equal ability.

The most recent comprehensive survey of opportunities for higher education is the Project TALENT study which followed members of the 1960 high school graduating class to find out what happened to them.[1] As Table 1 shows, able students were more likely to go to college, but within any ability group income exerted a strong influence on the probability of going to college. Among students with good ability (top 40 percent in achievement level), those from the top quarter of the income distribution had a 90 percent chance of going to college while those from the bottom quarter had only a 42 percent chance. Table 1 shows that a similar differential enrollment pattern held at each achievement level of students. Moreover, dropout rates from college are higher for those with lower income so college enrollments as a whole are even more skewed to upper-income groups than the information for entering students would indicate. A student from the top fifth of the ability distribution is three times as likely to obtain a college degree within four years of high school graduation if he comes from the highest quarter of the income distribution than if he comes from the lowest quarter.[2]

TABLE 1.—*Probability of high school graduates entering college full or part-time, within 5 years of high school graduation, by ability and socioeconomic status* [1]

	Ability					
Socioeconomic status:	1 high	2	3	4	5 low	Average
High: 1	0.95	0.84	0.69	0.56	0.40	0.79
2	.79	.63	.46	.34	.28	.54
3	.67	.52	.34	.27	.19	.39
Low: 4	.50	.36	.24	.17	.15	.23
Average	.79	.60	.41	.28	.20	

[1] Socioeconomic status is a composite variable which includes parental income, father's education, and several other factors. Ability is also a composite variable determined by several test scores and other factors.

Source: Project TALENT 5-year followup surveys of 1960 high school students.

2. HIGHER EDUCATION IS A GROWTH INDUSTRY

Higher education is presently growing much faster than the economy in general. Between 1960 and 1970, expenditures for higher education will have risen from $6.6 billion to an estimated $20 billion. The proportion of GNP devoted to higher education will have gone from 1.4 percent to about 2.3 percent.[3] This remarkable growth reflects two factors which seem likely to continue though perhaps not at such a rapid rate: rising enrollment and rising expenditures per student. The number of students enrolled in higher education doubled in this ten-year period, both because the number of young people was rising rapidly as the postwar baby boom reached college age and because the proportion of young people going to college was rising. The increase in the number of young people reaching college age will slacken off in the 1970's, but the proportion of the college-age population seeking a higher education seems likely to continue to increase. Aspirations for higher education are rising, and there seems every reason to think that if college places are available they will be filled.

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[1] Project TALENT, financed by the U.S. Office of Education, tested 100,000 students in a sample of high schools, then followed a subsample to find out what happened to them.

[2] The Project TALENT data were obtained for 1960 high school graduates, and it is possible that opportunity has become more equal in recent years. Information collected for freshmen in 1968 by the American Council on Education, however, do not reveal any major changes. But the ACE data are not exactly comparable to the earlier Project TALENT data.

American Council on Education, *National Norms for Entering College Freshmen—Fall 1968,* ACE Research Reports, Vol. 3, No. 1, 1968.

Expenditures per student have also been rising rapidly. Between 1960 and 1966, higher education expenditures per student increased about 5½ percent annually or considerably faster than the general price level. The main reason for this increase is that wages are the major item in higher education budgets. Since wages have been rising faster than prices in the economy, industries like higher education which use a lot of manpower tend to have rising unit costs. Moreover, faculty salaries have risen even faster than the general wage level. If a breakthrough occurs in teaching techniques—use of teaching machines or use of students to teach themselves or each other, for example—then the ratio of faculty to students may decline in the future. At the moment, however, no such increase in "productivity" of the teaching force is apparent. In fact, the trend in many institutions especially private ones is toward higher faculty-student ratios, reflecting lower teaching loads of research-oriented faculty. Unless these trends are reversed and faculty-student ratios begin to fall in the future, the trend toward rising expenditures per student will undoubtedly continue.

3. ALTHOUGH PRIVATE EDUCATION REMAINS VIGOROUS, STUDENTS ARE INCREASINGLY CONCENTRATED IN PUBLICLY CONTROLLED INSTITUTIONS

Enrollments have been increasing in both private and public institutions, but faster in the latter. In the early 1950's, they were about even; by 1959–60, 58 percent of the students were in public institutions and by 1965–66, public enrollment was 66 percent of the total.

In the same period the income flowing into both types of higher educational institutions has increased—both from private sources (especially tuition and fees), and from public sources (especially the Federal Government). Table 2 shows the shifts in the proportion of current income of higher educational institutions coming from various public and private sources.

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[3] U.S. Department of Health, Education, and Welfare, *Toward a Long-Range Plan for Federal Financial Support for Higher Education*, January 1969, p. 1.

TABLE 2.—*Current income of institutions of higher education by type of institution and source 1959–60 and 1965–66*

[Dollar amount in millions]

Income source	All institutions				Public institutions				Private institutions			
	1959–60		1[illegible]6		1959–60		1965–66		1959–60		1965–66	
	Amount	Percent distribution	Amount	Percent distribution	Amount	Percent distribution	Amount	Percent distribution	Amount	Percent distribution	Amount	Percent distribution
Tuition and fees	$1,161.8	20.0	$2,765.4	21.6	$332.0	10.1	$892.0	12.1	$829.8	32.7	$1,873.3	34.7
Federal Government, total	1,040.9	17.9	2,671.9	20.9	546.4	16.7	1,357.1	18.6	494.4	19.5	1,296.6	23.9
Organized research	(828.7)	(14.3)	(2,037.8)	(15.9)	(363.5)	(11.1)	(894.8)	(12.1)	(465.2)	(18.3)	(1,142.9)	(21.1)
All other Federal	(212.2)	(3.6)	(634.1)	(5.0)	(182.9)	(5.6)	(480.3)	(6.5)	(29.2)	(1.2)	(153.7)	(2.8)
State government	1,389.3	23.9	3,032.0	23.6	1,353.1	41.3	2,946.8	39.8	36.1	1.4	85.3	1.6
Local government	151.7	2.6	318.2	2.5	147.3	4.5	310.8	4.2	4.5	0.2	7.4	0.1
Endowment earnings	206.7	3.6	318.5	2.5	19.7	0.6	30.2	0.4	187.0	7.4	288.3	5.3
Private gifts and grants	383.2	6.6	650.6	5.1	85.5	2.6	159.8	2.2	297.7	11.7	490.8	9.1
Auxiliary enterprises	1,006.0	17.3	2,115.3	16.5	545.0	16.6	1,185.9	16.0	461.0	18.2	929.9	17.2
Student aid income (grants)	94.2	1.6	244.6	1.9	41.9	1.3	118.6	1.6	52.3	2.1	126.0	2.3
Other	379.1	6.5	688.5	5.4	205.8	6.3	378.4	5.1	173.5	6.8	310.0	5.8
Total current income	5,812.8	100.0	12,805.5	100.0	3,276.6	100.0	7,397.7	100.0	2,536.1	100.0	5,407.8	100.0

Source: *Toward a Long-Range Plan . . .*, p. 43.

The vigor of privately controlled higher education is evidenced by the remarkable increase in income per student in the private sector over the last few years. Private universities increased their current income per student at a rate of 8.1 percent between 1959–60 and 1965–66 as contrasted with 4.6 percent for public universities. Similarly, private four-year colleges increased their current income per student considerably faster than public ones.[4]

WHAT KIND OF A SYSTEM DO WE WANT?

Nothing could be more obvious than present dissatisfaction with higher education. Students clearly want education which is more responsive to their needs and interests, and over which they have more control. There is widespread concern—not just among student radicals—with how colleges and universities are governed, how effectively they teach and respond to the needs of their students and faculty, and to the community around them. Most of the dissatisfaction seems to be with the curriculum and governance of individual institutions, not with basic structure of higher education itself. Only a few students and faculty radicals are seriously attacking the arbitrary assumption that it takes four years to get "a college education" and that these four years are best spent immediately after high school, the tyranny of degrees and credit hours, or the separation of learning from the rest of life. Maybe serious consideration should be given to scrapping the whole enterprise and substituting something new, perhaps a more flexible arrangement for mixing work and study at all ages. Right now, however, even the reformers seem to be looking forward to a higher education system which still involves colleges and universities whose major mission is to provide general and specialized education for young people after high school.

We have not taken a poll, but we believe that most people would agree that the salient characteristic of our higher education system—its diversity—should be preserved, that it is important to give the student a wide variety of choices among small and large institutions, public and private ones, selective and less selective. They also value autonomy of individual institutions. They believe that individual institutions, not government, should decide what to teach and how to teach it, although they might disagree on the division of power within institutions. We also believe that most Americans would subscribe to two other major goals for higher education: (1) making higher education genuinely accessible and available to all qualified students regardless of income level, (2) improving higher education quality by providing more resources per student—more qualified faculty, better buildings and equipment.

When resources are limited, these goals conflict. In particular, the objective of increasing the number of students from low-income groups may make it more difficult to increase the average quality of education for all students. Moreover, a few people believe that we have too high a proportion of students enrolled in higher education already and many would put improvement in elementary and secondary education, or urban housing, or rural nutrition, or other social goals ahead of increased resources for higher education. Nevertheless, most Americans seem to believe that the Nation can afford, in addition to meeting other social goals, to improve its higher education system, and that improvement implies more students (especially more low-income students), gradually increasing resources per student, and a consequent increase in the proportion of our national resources flowing into higher education. The disagreement is over the relative emphasis given each goal and who is to bear the burden of financing these goals.

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[4] *Toward a Long-Range Plan* . . . , p. 46.

WHO BENEFITS AND WHO SHOULD PAY?

Higher education has both public and private benefits. Students who get a higher education earn more, have access to more interesting and higher status jobs, and the possibility of leading a fuller life. Students and their parents are clearly conscious of these private benefits—most of those able to pay for higher education are willing to do so.

Although it is difficult to estimate the effect of price on student attendance, a recent study confirmed what one would expect; namely, that the tendency for upper-income students to go to college is not much affected by the price of education while low-income students are far more sensitive to price.[5]

The student himself is not the only one who benefits from his higher education. Higher levels of scientific and cultural achievement, more intelligent laws and public decisions, and a more open society are all consequences of increased higher education which benefit everybody, not just those who happen to get the education. These unmeasurable, but nevertheless real, public benefits of higher education justify a public subsidy to ensure greater production and consumption of higher education than would otherwise occur. Moreover, even if there were no public benefits a society might choose to subsidize higher education as a convenient way of equalizing opportunity and altering the income distribution. In any case, all advanced societies seem agreed that there are cogent reasons for subsidizing higher education. The question is how large the public subsidies should be and how they should be paid.

If we were starting a new country with no higher education institutions in existence, the choices would be wide. Suppose this new country decided that higher education must be subsidized in order to make it accessible to a larger number of students than would buy it if it were privately purchased? This country would then have to face three important and related questions. Question One is: should these subsidies go to institutions or to students? The new country might choose to subsidize institutions of higher education to enable them to offer higher education to students at a price below cost or even free. It could do this either by supporting publicly operated institutions or by contributing to the budgets of privately controlled ones. Alternatively, the new country could support students in order to enable them to pay for higher education. The support to students could take the form of grants or loans or special work programs to enable them to earn additional income.

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[5] *Toward a Long-Range Plan . . . ,* Appendix B.

Which course the new country chose would depend partly on how much faith it had in consumer sovereignty and the market mechanism. If the public believed that the best way to get "good" education was to allow students to choose among different types of education at prices roughly related to costs, then it might favor putting purchasing power directly into the hands of students. If the public had little faith in the market mechanism in education it might, for administrative convenience or out of faith in the wisdom of college administrators, choose to support institutions directly.

This new country would also have to decide Question Two: namely, should the public subsidize everybody who meets the intellectual qualifications for higher education or only those who cannot afford to pay? A program with a means test clearly requires less tax money than a general subsidy, but may have much less political support.

Question One and Two bear no necessary relationship to each other. In the United States we tend to think of institutional aid as necessarily a subsidy to all income groups, because most American institutions charge a uniform price to all students. We tend to think of student aid as an appropriate vehicle for subsidies to needy students because student aid has often been based on need. Our mythical new country, however, would not be bound by these historical accidents. It could choose the student aid route, but give aid to all students regardless of income level, or it could aid institutions, but direct the institutional subsidy primarily to low-income groups. This could be done by subsidizing institutions particularly accessible to low-income students, or by having the institutions aided charge a sliding scale of fees depending on the student's income.

Finally, our new country would have to decide Question Three: does it want both publicly and privately controlled higher education institutions, and in what proportion? This question, again, bears no necessary relationship to the first two. Institutional aid could be given to both public and private institutions, and in different proportions. Substantial direct subsidization of private institutions, however, would tend to blur the difference between public and private (as it has in England). Substantial reliance on student aid would also tend to blur the distinction between public and private institutions since both would charge tuition. There is no reason, however, why some institutions could not be publicly controlled even though the subsidy went in the first instance to students.

Actually, of course, we are not starting a new country. We already have a country in which the choices alluded to above have been made, although in somewhat different ways by different States.

At the elementary and secondary level, Americans apparently believe that the benefits of such education to society as a whole are so great that elementary and secondary education should be offered free within commuting distance of the student's home, and indeed that all students should be compelled to attend school well into the teen ages. No one denies that there are private benefits of elementary and secondary education, nor that most parents would be willing to pay for such education if it were not publicly provided. The public benefits of ensuring that everyone gets education at this level are thought to justify public provision of the education for everybody including those who could well afford to pay.[6]

Higher education, however, developed differently; in fact, two traditions developed side by side. The tradition of higher private educaton developed in the East and spread West. The private institutions charged for their services, and always catered mostly to those who could afford to pay. At the same time they kept their charges below cost, thanks to church support and private philanthropy, and always took in some students who could afford to pay little or nothing. The Northeastern States in which private institutions were strong made only limited efforts—at least until recently—to support public institutions. They relied on private institutions to supply much of the market, in some cases subsidizing those private institutions to a limited extent, or offering aid to students who attended either public or private institutions.

By contrast, the tradition of free public higher education took roots in the middle and far West and has only recently had a strong growth spurt in the Northeast. While private higher education institutions rarely charged full cost, public higher education was not entirely free. Students usually had to pay some fees, but, more important, many of them had to bear the additional expense of living away from home, not to mention the sacrifice of earnings given up in order to pursue a higher education. In general, public institutions have charged a uniform price, although Michigan State University is now experimenting with a sliding scale of fees based on income. Some States, such as California, have made a vigorous and costly effort to bring free public higher education within commuting distance of almost all potential students. Others have offered higher education only at a few campuses often located far from centers of population.

As we have seen, however, opportunity for higher education is still far from equal. Public as well as private institutions tend to draw students from families with above-average income. Even our most democratic institutions, the public two-year junior colleges, have student bodies whose families have incomes on the average higher than that of the general population. At the elementary and secondary level, everybody pays for a public education system to which almost everybody goes. At the higher education level, however, the tax payer pays for a higher education system to which anyone *may* be admitted, but which in practice services disproportionately the upper income groups.

PRESENT CHOICES

Given this situation, we have some national objectives over the next several years: (1) to increase the number of students benefitting from higher education by removing the barriers to attendance for those in lower income groups, (2) to increase the resources flowing into higher education (both total and per student), and (3) to accomplish all this while preserving diversity in the system and autonomy of individual institutions. What choices do the public have?

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[6] The public has not always provided "equally good" education for all income groups, however. Moreover, some critics of the public schools feel that providing subsidies (perhaps in the form of education vouchers) to enable parents to purchase education would lead to a more responsive, productive school system.

First alternative: major emphasis on increasing the availability of free public education.—An obvious option is to put the major share of additional public resources (whether State, local or Federal) into building more low or free tuition community colleges, expanding existing public institutions, and building new ones in and around cities where the bulk of the students are. To many this seems a logical development. Higher education is becoming as necessary to good jobs, productivity, and status in the community as secondary education was a generation ago. Provision of free, public higher education seems as much a part of the public duty as provision of free, public secondary education was then.

There are three arguments against this course of action. First, it is relatively expensive to the public treasury since it involves providing free education to many who could afford to pay. The expense could be lessened by charging tuition at publicly controlled institutions in accordance with ability to pay, although the popularity of this idea is doubtful. Second, free public education by itself will probably not equalize opportunity among income groups. Special efforts to locate public institutions in the inner-city would help, but many low-income students especially from rural areas need financial assistance even to attend a "free" institution. Third, such a policy by itself would hasten the relative growth of public institutions which has been going on for some years, and might force a lot of private institutions out of business or into public hands. We would probably eventually end up about where we are in elementary and secondary education; with a vast preponderance of students in public institutions but with the survival of a few private institutions due to excellence, specialization or snob appeal.

Second alternative: channel additional public resources mainly into student aid for needy students.—No one would seriously advocate abolishing public institutions, but it would be possible, while continuing to support public institutions, to channel the bulk of new public resources for higher education (whether State, local, or Federal) into student aid. This is an attractive policy to those who believe strongly in enhancing the power of the consumers of education and to those who give high priority to equalizing opportunity among income groups. Emphasis on student aid could also improve the competitive position of the private sector in higher education. Student aid would tend to reduce tuition differences between public and private institutions, since the incentive to keep public institutions free would be reduced if students had public grants available with which to pay tuition.

In choosing among different types of student aid one has to balance the effectiveness of the aid (in terms of the number of students enabled to go to college or to better colleges than would otherwise have been possible) against the cost to the public treasury.

The costs are not as hard to figure as the effectiveness. Clearly a loan to a student costs the public less in the long run than a grant of the same amount. A work-study grant costs the treasury no less than a straight grant, but may have some offsetting benefits to the institution which employs the student. A grant (or loan) program with a means test clearly costs less than a program which provides aid to all students at levels high enough to make a real difference to those in low-income groups.

Effectiveness is harder to estimate, since it involves inferences about student behavior. Grants are undoubtedly more effective in inducing low-income students to go to college than loans in the same amount. Low-income students tend to be reluctant to borrow for their education even if funds are available on generous terms. A contingency repayment loan plan (one in which the borrower agrees to pay back a percentage of his future income) would overcome some of the reluctance of low-income students to borrow, but it is not known how much. A work-study grant is presumably less attractive to students than a straight grant and it is hard to say how working affects the students performance in college. Unless the work is educational in itself it may simply use up time and energy and make it difficult for the aided student to compete with his more affluent and perhaps better prepared fellow students who are not required to work. On balance the authors feel that the best combination of student aid plans is (1) a grant program based on need, for students from families with below-average incomes or above-average number of children or both, and (2) a generous loan program (either fixed term with a long repayment schedule or contingency) to supplement the grants and help those in the upper-income groups spread expenses over time.

ENTER THE FEDERAL GOVERNMENT

The above discussion is all in terms of "public" subsidization of higher education. The major options exist whether "the public" is operating through local, State or Federal Governments. Since State and local governments have been the major instruments for public support of higher education in general (excluding special interests of the Federal Government, such as graduate education and research), one might ask why this should not continue. Why there is need for any new Federal initiatives in financing undergraduate education? Why not let the public interest find its expression through State and local action?

The answer of those who believe the Federal Government should play a greater role is essentially that States and localities will not do "enough" and may do the "wrong" thing.

The idea that States and localities will not do "enough" rests on two arguments, one theoretical and one practical. The theoretical argument is that small geographical areas tend to underfund a public service whose benefits spill over into other geographical areas. Since educated people migrate, individual States and communities have less incentive to provide higher education than they would if they could be sure that the educated people would stay home. Hence, the level of public subsidy to higher eduction will be less if public desires are expressed through State and local governments than if they are expressed at the national level.

The practical argument is that, despite strong support of higher education by State and local governments in the past, equality of educational opportunity is still far from a reality. The States have been either unable or unwilling to put up the resources necessary to equalize opportunity for higher education. Even in States where free public education is widely available, able students from low-income groups are far less likely to obtain a higher education than able students from upper income groups. The prospects for greater efforts in the future do not look promising. State and local governments are faced not only with rapidly rising cost in higher education, but with tremendously increased pressures for all sorts of other public services, including elementary and secondary education, health, highways, recreation, conservation and the like. All of these pressures are also being felt at the Federal level, of course, but the Federal tax system is better able to meet the demands. State and local tax systems rely heavily on sales and property taxes that fall more heavily on the low-income groups and are far less responsive to economic growth than the Federal tax system with its heavy component of progressive income tax.

The argument that States and localities will do the "wrong thing" comes from those who believe—for a variety of reasons—that provision of free public higher education should not be the only method of public subsidization. It seems likely that most States will put their additional funds for higher education into expanding and improving their publicly operated institutions. Substantial student aid programs or institutional aid to private institutions (unconstitutional in some States) seem unlikely to be major vehicles for State or local subsidization of higher education. Hence, those who argue for an increasing Federal role in financing higher education include both those who believe it is desirable for the public to subsidize students directly, and those who believe in the desirability of aid to private as well as public institutions.

To sum up an argument which seems persuasive to the authors: the Federal Government should play a larger role in providing the subsidy for higher education both because the States and localities by themselves will not subsidize higher education at a nationally desirable rate, and because the methods they are likely to choose will not be the best ones from the point of view of insuring equality of opportunity and preserving the diversity of a partially private system.

THE FEDERAL OPTIONS

Realistically then, the Federal Government has a choice among several general courses of action: (1) institutional aid for all institutions—public and private, (2) student aid of a variety of sorts, (3) some combination of the two. The choice depends largely on how great a priority is given at the Federal level to improving equality of opportunity, and how much to increasing the resources per student available to higher education. If a high priority is given to improving equality of opportunity—as we think it should be—then establishment of a major student aid program, insuring that all with ability are able to go to college, is the first order of business for the Federal Government. We believe that Federal subsidies should be available to all those who can gain admittance to an accredited institution of higher education, but who do not have the funds to go. The amount of aid should be based on the family income of the student and the number of members of the family. Somewhat different student aid programs meeting these criteria have been proposed both by the Carnegie Commission and the Department of Health, Education, and Welfare under the Johnson Administration, and several bills are pending before Congress.[7]

Grant aid from the Federal Government will insure that needy students have the funds to go to college. Students from more affluent families, however, also need help in spreading the cost of education over time. Moreover, needy students will require additional funds if they choose to go to more expensive institutions far from home. For these reasons, an ample supply of loan funds repayable on convenient terms is desirable. Present Federal loan programs do not meet this need. We would favor the establishment of a Federal loan bank for students with long-term payment possibilities and cancellation of the obligations of those in straitened circumstances.[8]

Aiding students will be an empty gesture, however, if institutions are not able and willing to provide them good education responsive to their needs. Since tuition never covers the full cost of higher education, we would favor a cost of education allowance to the institution taking a Federally aided student to help compensate for the additional cost. Such a program would channel substantial amounts of institutional aid into those institutions with expanding enrollment especially those making an effort to serve needy students.[9]

The cost of education allowance will be helpful in facilitating expansion of existing institutions to serve the needs of more students, and it should also encourage special efforts to recruit and hold needy students. But there is also the need for new institutions—especially in low-income areas of major cities. The capital outlays and land acquisition costs involved in starting a new institution in the city are large, and we believe that the Federal Government should assist States and localities in meeting these costs.

This package of Federal actions gives high priority to insuring equality of opportunity by channelling funds directly to low-income students and to institutions serving or being set up to serve these students. We believe that this is the most appropriate Federal priority for the support of undergraduate education—especially in view of the State and local commitment to general subsidization of higher education through the operation of public institutions.

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[7] *Toward a Long-Range . . .*, pp. 32–33.
Quality and Equality: New Levels of Federal Responsibility for Higher Education, Carnegie Commission on the Future of Higher Education, 1968, p. 17.

[8] See S. 1788 [Mondale Bill], for a loan bank which meets these requirements, pp. 33–45.

[9] For a more extensive discussion of the rationale for the cost of education proposal see *Toward a Long-Range Plan . . .*, pp. 28–29.

The Benefits and Costs of Alternative Federal Programs of Financial Aid to College Students

*André Danière**

I. GENERAL FRAMEWORK OF THE ANALYSIS

From the standpoint of policy formulators at the Federal level—which means individual members of Congress and executive policymakers—the problem of financial aid to students must be solved as part of a larger cost-benefit analysis concerning the whole financial structure of higher education. A given enrollment structure (specifying what kind of individual attends what kind of institution) can be obtained through any number of combinations of measures which include: direct subsidies to institutions, tax or other forms of inducement to philanthropic giving, earmarked or general Federal subsidies to State governments, matching grants to institutions or State governments, tax relief to parents of college students, various forms of direct financial aid to students, etc. The results achieved depend on the responses of parents, students, philanthropists, institutions and State governments to the various inducements which the policies generate. The problem faced by policy formulators at the Federal level is to combine their use of financial instruments in such a way that results are optimum from the standpoint of their own objectives.

There is not too much difficulty in specifying the "results" entering "objective functions" in this area, although the precise "value weights" attached to each are a matter for individual members of the Federal Establishment to decide. Taking the overall size of the Federal budget to have been determined independently, so that the direct fiscal impact of alternative financing decisions need not be taken into account, the main "results" of relevance can be listed as follows:

(a) Additions to (or subtractions from) gross national product over time. The positive element in this computation is the rise in labor productivity which enrollment shifts induced by Federal programs will generate over time. The negative element is the additional resource absorption (in student man-hours and direct education costs) caused by the induced enrollment structure.

(b) Increases (or decreases) in the degree of equalization of educational and career opportunities between socio-economic, racial or otherwise differentiated groups.

(c) Certain changes in the manner in which incomes, taxes, levels of personal consumption, jobs, and environmental comforts are distributed among the population.

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(d) Alternative benefits foregone as a result of pulling budget dollars away from other areas of Federal intervention.

The above list only covers the most obvious issues, ignoring a number of additional concerns which enter, at one point or another, to modify or qualify the choice of policy. These would include social and racial integration, distribution of higher education control (especially public vs. private), size of State budgets, etc. The main lines of Federal policy can, however, be specified by reference to an "optimization" solution in terms of the major objectives. The decision problem is then posed in the simple form:

"*Find the set of financial policies for which the sum of elements listed under (a), (b), (c), (d), each multiplied by the appropriate (positive or negative) value weight, is maximized.*"

It is not taking too much of the Federal consensus for granted to assume that, for most individuals concerned, increases under (a) and (b) would have a positive weight, changes under (c) could have either sign, and benefits foregone under (d) would enter negatively.

Giving the scarcity of budget dollars, it can be stated as a general rule that all solutions that are not "budget dollar efficient" should be rejected, i.e. any policy that procures the same results under (a), (b), and (c) at a lesser budget cost should be preferred. Since, furthermore, Congress tends to display a preference for the spending of future, rather than present, budget dollars, different time patterns of budget spending must be compared by applying positive time discounts to future budget dollars[1] and summing up the discounted quantities. Finally, the value of benefits foregone can be taken as a fixed multiple of the discounted budget cost of the financial program, the multiplication factor representing the "marginal value" placed by the policy formulator on a "general" budget dollar. The latter is larger than one if the individual views the size of the Federal budget as less than optimum, less than one if he feels that the budget is too large or grossly mismanaged.

The "time discount" of future budget dollars bears no direct relation to the "investment" discount applied in comparing resource costs and productivity benefits generated over time by the Federal programs. It only reflects a time preference of taxpayers (and their representatives in Government) concerning redistribution of their income through Federal taxation. There is, of course, an indirect connection, in that rational taxpayers must discount future tax payments by reference to present investment opportunities.[2] But the collective process of decision, driven as it is by individual attempts at shifting burdens on others, does not fully reflect the rational time preferences of individuals, just as it does not reflect their rational preferences between private and collective services. The average taxpayer views every budget increase as a personalized attack on his financial comfort, and the struggle to pacify his fears in the current year (or before the next election) leaves little room for systematic analysis of budget alternatives over time. It is apparent that a very high discount is applied, in practice, on future budget receipts and expenditures, with the observable result that expenditures are deferred for as long as heavy political pressures or impending crises do not make their enactment imperative.

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[1] The discount rates need not be constant from year to year and may reflect various expectations of budget ease or tightness in the coming years.

[2] Under an income progressive system of taxation, and to the extent that individual incomes rise relative to the average over the life cycle, an average individual can expect to pay a higher proportiton of the total tax bill next year than now; if so, the rate of discount he applies to future public budgets should be somewhat less than his alternative rate of return. On the other hand, a large proportion of voters fail to take investment opportunities into account and discount future budgets and taxes on the basis of the greater financial ease they expect (or dream) to enjoy in coming years.

1. General Strategy

These are only a few of the "simplifications" that can be introduced to render the decision problem manageable and to develop solutions of general applicability for a wide range of individual value systems. The present analysis relies on two major "assumptions," one to be lived with through the end, the other only temporary.

(a) *The set of Federal financial programs concerning higher education is taken as given, except for general programs of financial aid to students.* In other words, the analysis is limited to policy variations within the restricted area of student financial aid, and possibilities of substitution between this and other forms of financial intervention are ignored.

(b) *In a preliminary step, it is also assumed that support patterns on the part of other agencies, i.e., States, philanthropies, institutional endowments, are not affected by variations in Federal financial aid to students.* More precisely, the maximum capacity of each class of institutions (where class is defined by type of instruction and tuition level) is assumed to grow independently of Federal student aid policies, the latter affecting only the extent to which those capacities are created and filled. This means that, for all enrollments below the maximum projected capacity in each class, financial contributions from State, municipal and philanthropic sources will be adjusted to pay the difference between tuition receipts and actual education costs. It is further assumed (again provisionally) that the Federal Government can so regulate *its* distribution of student aid that *other* sources of student financial aid will not only be maintained at their present level but will be distributed so as to maximize the effectiveness of Federal aid. This means that, *in the first approximation, other sources of financial aid can be treated as an added financial resource of the Federal Government which it can "get distributed" at no cost to itself.*

2. Tactical Steps in the Preliminary Analysis

As already indicated, the preliminary analysis assumes that capacity in each class of institution can reach a specified maximum over each year of the projected horizon, the actual capacity created and filled under this limit depending on the number of enrollments induced. Classes of institution are defined along two dimensions, one describing type of instruction and the other tuition and fee level. Type of instruction can itself be described in terms of several characteristics, including curriculum type and level of instruction costs per pupil.[3]

Assuming that Federal authorities can significantly control—through the leverage of their own programs—the allocation of student aid by other agencies, the problem facing policy formulators at the Federal level can be put as follows:

"Given the maximum value of benefits under (a), (b) and (c) above achievable through student financial aid at successively higher budget costs, find that budget cost—and specify the corresponding aid programs—at which the "marginal" value of benefits created by a budget dollar in student financial aid is equal to the "marginal" value of a "general" budget dollar.

This recipe relies on the simple notion that something is gained by expansion as long as additional budget dollars in the programs create a higher value of benefits than they would in alternative services, but that expansion should cease where additional benefits are worth no more, and would soon be worth less, than what those dollars could generate elsewhere.

The first, and crucial, step in this procedure consists in determining what programs maximize benefits at each successive level of total budget cost. It is useful, in this connection, to distinguish between two major dimensions of an aid *program*. The first is the *size* of funding offers, i.e., how much, in whatever form, is offered (potential) students of various descriptions in the way of financing. The second is the set of *conditions*, or "packaging rules," attached to the funding offer, i.e., how much comes as a straight grant, how much as a loan repayable under specific terms, how much as a (subsidized) wage for work performed, etc. Not only is the distinction a useful one conceptually, but the determination of "best" programs at each total budget cost can be handled in relatively independent steps along each of the two dimensions.

Level 1—Best packaging rules

Starting with an arbitrary pattern of enrollments and aid funding levels—where the "pattern" specifies classes of students (by income and measured aptitude) and institutions (by instructional characteristics and tuition level)—the following problem can be solved:

"Specify a set of 'packaging' rules such that (1) students will accept the specified funding if their enrollment depends on its availability, (2) the burdens placed on them and their families are "tolerable" by current social standards and (3) the above two requirements are fulfilled at the minimum possible budget cost."

The "burdens" referred to include student commitments to repay the amount funded at interest (student loans) or to supply certain amounts of work (work-study programs), as well as the reduced consumption levels experienced by themselves and their families. The insistence on "tolerability" by current social standards has to do with the "distribution" objective mentioned under (c) in the introduction: it is used here as a fixed constraint on what we allow the program to do rather than as value weighted variable, and it is narrowed down to one distribution concern only, i.e., the discomforts suffered by parents and students, both now and in the future, as a result of undertaking higher education.

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[3] Maximum capacities may also be specified for the weighted sum of enrollments in two or more distinct educational patterns in the institution class, e.g., part time vs. full time.

Conditions (1) and (2) limit the set of "feasible" packaging rules to those under which aid offers are acceptable to students and the burdens imposed are viewed as "tolerable." Some of these feasible rules are clearly cheaper than others in terms of budget dollars: Grants out of the Federal budget are the costliest of all, requiring one present budget dollar per dollar of aid funding, while a Federal guarantee of loans supplied by private lending institutions is nearly costless. It is possible to compare different feasible "packaging rules" in terms of their effect on total budget cost and to select that set of rules for which budget cost is minimized.

Level 2—Best funding offers

Given the set of packaging rules selected above, the following problem can be solved next *for any selected level of total aid funding:*

"Specify the funding offers to be made (under the packaging rules) so that the value of benefits under (a) and (b) is maximized; determine the corresponding pattern of enrollment and actual aid fundings, as well as the total budget cost of the program."

The answer obviously depends on how different classes of students react to schedules of aid offers in different classes of institutions. It also depends on how much value the policy formulator puts on various enrollment patterns, whether from the standpoint of net economic productivity (objective (a)) or from that of establishing more equal opportunities (objective (b)).

We are, unfortunately, very poorly equipped to provide adequate answers at this level, mostly because the behavioral information concerning student responses to aid offers is sparse and inadequate. A few relevant bits of information gathered by the author from a study completed in 1967 are given in an appendix to this report, but they do not constitute the kind of "demand function" one would wish to have. Reliance must, eventually, be put on rather arbitrary assumptions, few of which can even conceivably be tested on the basis of available data. Concerning the "value system" entering in the comparison of results under alternative aid distribution patterns, the traditional "productivity" criterion favored by economists may lead to disturbing conclusions when used as a single objective: since relatively well-to-do students require much less aid funding than poor ones to attend any given institution, more students can be drawn to higher education (and thus more economic returns generated) out of a limited aid fund by giving priority to the relatively affluent and aiding the poor only in low tuition institutions. This order of preference is only reversed when explicit account is taken of the objective of equalization of opportunities.

Integration of levels 1 and 2

For certain detailed specifications of the two problems, it can be shown, after investigating the properties of each solution, that (1) the "best" packaging rules in step 1 can be formulated independently of the aid funding and enrollment pattern, (2) any shift away from those rules tends to reduce the benefits generated in step 2, and (3) higher levels of total aid funding in step 2 result in higher total budget costs. The determination of what aid programs maximize benefits at each successive level of total budget cost can thus be achieved by considering successive levels of total aid funding and solving the level 2 problem in each case. The "program" consisting of the calculated aid funding offers and of the basic "packaging rules" gives maximum benefits for the calculated budget cost. The solution also generates the predicted pattern of enrollments and actual aid fundings.

Scope of the present analysis

The present paper concentrates entirely on the level 1 problem, i.e., the determination of a set of "packaging rules" for the minimization of budget costs. Work is now in process on the resolution of step 2, but results will not be available until later in the year.

II. DETERMINATION OF OPTIMUM PACKAGING RULES

under assumed Federal control of all student aid sources
and non-reactivity of tuition levels

1. Budget Cost of Alternative Forms of Aid

As pointed out earlier, the costliest forms of student aid from the Federal Budget standpoint are grants directly financed out of the budget. Subsidized loans out of the budget come next, having the same immediate budget impact but generating budget dollars in future years as loan repayments are made. The budget cost of aid dollars under work-study programs may be higher or lower depending on how much of the wage paid out to students is Federally subsidized. Unsubsidized loans out of the Federal budget have a low cost, although still a positive one if, as is possible, the discount rate applied to future Treasury receipts (student repayments) is higher than the commercial rate of interest on loans. Unsubsidized loans given by private lenders under some form of Federal guarantee are the cheapest of all, the only budget charge being for administration and whatever small subsidy may support the guarantee.

If, as assumed earlier, the disposition of aid funds available from non-federal sources can be indirectly controlled by Federal aid policies, all such funds should be treated as a cost-free element of the Federal arsenal. Since, however, the most feasible by far of all forms of control applicable to the disposition of outside funds is a rule according to which institutions (if their students are to qualify for Federal aid) must procure non-Federal aid so as to reduce the Federal cost of full aid funding by a fixed minimum, the set of optimum packaging rules can be obtained without reference to the specific size or composition of the non-Federal aid pool. The packaging rules that minimize Budget cost in the absence of any outside contribution to financial aid will also minimize it when that cost is independently reduced by a fixed amount.

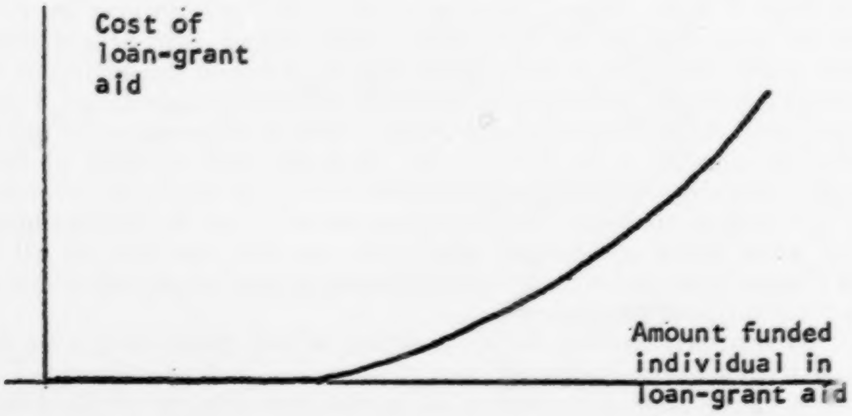
2. General Framework of Analysis

The basic analysis operates in terms of budget cost minimization of a prespecified funding pattern *at a given institution.* The funding pattern specifies the amount (but not the form) of financial aid to be given each class of (potential) students over the expected period of their enrollment. The problem, as now stated, is to find the combination of grants, loans and work-study offers to each student under which the budget cost of aid is minimized. The original statement of the problem refers to two separate constraints, one insuring that the conditions imposed (future repayments, work) are tolerable according to social consensus, the other that the conditions are acceptable to the student. However, by making social standards of tolerability fairly demanding, we insure that the conditions of student acceptability will also be met, so that only the former constraint need be retained.

A. While the determination of a minimum cost combination of aid programs requires joint consideration of all program categories, we assume that tolerability constraints affecting work-study will operate independently of those affecting loans and grants.

(a) Given the tolerability constraints specified in section 4 below, the cost of supplying alternative amounts of aid through loans and grants under tolerable conditions can be expressed independently for each individual as a function: $C_M = f_M$ (M), where M is the amount of loan-grant aid and the function has the general shape illustrated in diagram 1.

Diagram 1



(b) With regard to work-study (section 3 below), we specify a fixed tolerability constraint in terms of number of hours worked per year, which translates into a constraint on job earnings per year.[4] In contrast with loan-grant aid, the cost of job-aid is not directly related to the amount which the individual receives. Rather, the cost per dollar of job aid procured depends on the aggregate employment of college students in each local labor market: The more jobs we wish to generate at a given location, the greater the average "placement" cost; beyond a certain point, additional jobs may not be obtained in the absence of subsidies to employers, going all the way to complete reimbursement of wages paid students. The budget cost per dollar of job-aid provided to students at any institution is thus a rising function of aggregate job-aid, with values between 0 and 1.

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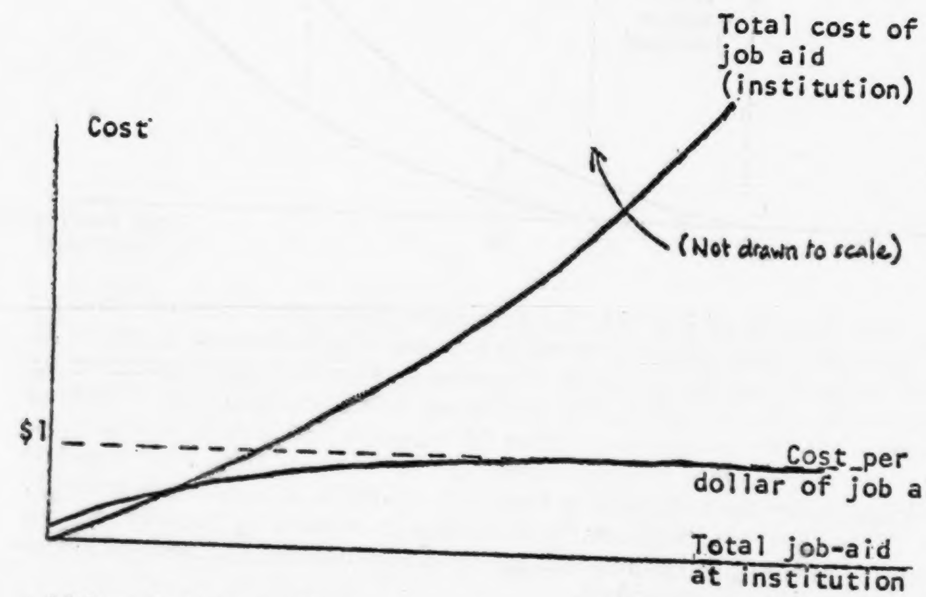
[4] The translation requires the addition of an "equity" constraint under which earnings per hour in work-study programs tend to be equalized.

Diagram 2



Although the employment cost curve of each institution depends on the job-aid policies of local competitors, we can resort to partial analysis, taking the curve of each institution as given once a national job-aid policy has been established.

B. Given the above specifications, the search for a cost minimizing set of aid programs may proceed as follows:

(a) Given the aggregate amount of job-aid available at some total cost C_J at the institution, determine the complementary loan-grant aid (and the distribution of all three types of aid) that satisfy funding requirements at the minimum possible cost.

(b) Repeat the minimization for alternative amounts of job-aid, increasing the amount (and the cost) as long as the associated reduction in loan-grant cost is more than the increase in job-aid cost.

(*1*) *Minimization of Loan-Grant Cost Given Total Job-aid at the Institution*

The strategy for minimizing loan-grant costs in association with different amounts of job-aid at the institution can be determined by reference to *individual* loan-grant cost minimization, as illustrated in diagram 3.

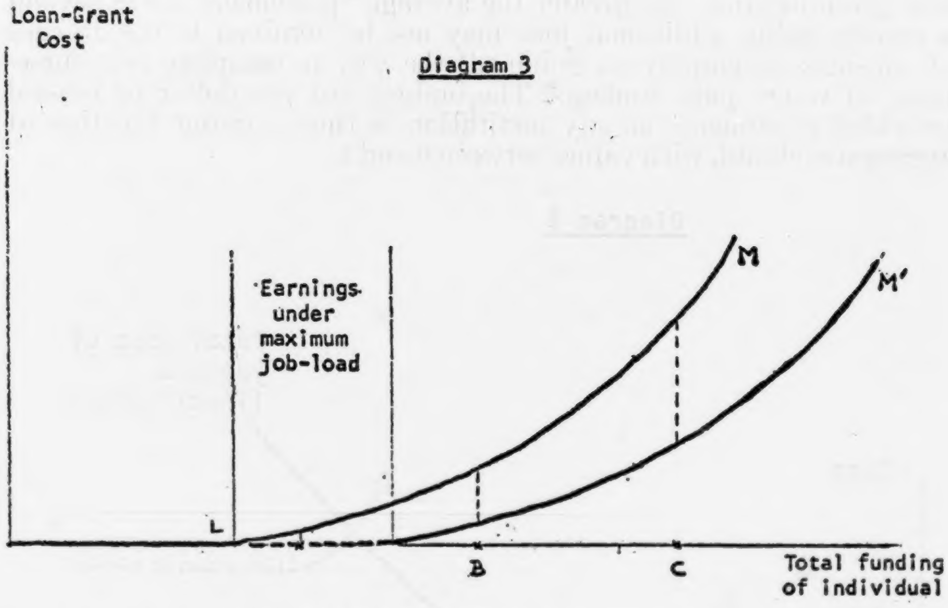


Diagram 3

In the absence of job-aid, the minimum loan-grant cost of funding the student to any specified level is obtained by reference to curve M, which reproduces the curve in diagram 1. For a student working up to the limit of tolerability, the minimum cost is obtained by reference to curve M^1. M^1 is obtained from M through horizontal translation, the shift being equal to earnings under a full job load. For students working under the tolerability limit, the translation is correspondingly less. Note that we treat hourly earnings as a fixed parameter, on the assumption that minimum earning standards are maintained (if necessary, through wage subsidy).

It is clear from diagram 3 that the reduction in loan-grant cost achieved by providing a given amount of job-aid is larger the larger the individual's funding need. (Compare A, B, C; the cost reduction is shown by the vertical distance between the two curves). More generally, any transfer of job-aid from some individual to one with higher funding needs will reduce the aggregate cost of loan-grant aid. It follows that *aggregate cost minimization at the institution requires distributing the given total of job-aid on a priority basis, seeing that no student receives job-aid until all those with higher funding need have received job-aid up to their tolerability limit* (or up to their need above "costless" loan-grant aid, OL, whichever is smaller). Given the job-aid received by each student on this principle, the remaining funding need is covered through loan-grants at minimum cost (by reference to 1).

(2) *Expansion of Aggregate Job-Aid until Marginal Addition to Cost Equals Marginal Reduction in Loan-Grant Cost*

The relation between amount of job-aid at the institution and its cost C_J is directly derivable from the "unit" cost curve in diagram 2. With each increase in C_J, the funding needs of individuals reached by the new job-aid are less, and the saving in loan-grant costs is accordingly reduced. Expansion should cease, and total costs of aid will have been minimized, when the marginal cost of expanding job-aid becomes equal to the marginal saving of reducing loan-grants.

(3) *Correction: External Losses and Benefits of Job-Aid*

Section 3 below describes external benefits and losses of job-aid which have not been accounted for so far in the analysis. Although no precise measure of these externalities is available, it can be inferred that, if degrees of freedom are used appropriately, net external benefits are zero until cost per dollar of job-aid reaches a certain level, then increase with job-aid cost (and with total job-aid provided) beyond.

These net benefits must be added to those identified under (a), (b) above in the final determination of a "best" program of Federal financial aid to College students at a pre-specified total budget cost. Although, in the first analysis, this would require a re-statement of the solution pattern outlined in section I, it can be shown, after examining the partial solutions at levels (1) and (2) in the absence of externalities, that the present framework of analysis can be retained, replacing the cost of job-aid C_J by a *net cost* $C_J - b/m$, where,

b=value of net external benefits of job-aid

m=marginal benefit (in terms of (a) and (b)) of a budget dollar in the aid program finally selected.

As an additional condition, individual jobs should be considered and distributed in increasing order of their net cost (budget cost minus adjusted external benefits) per dollar of aid, and the benefits b associated with a total cost of job-aid C_J in the above adjustment are those resulting from this policy when total cost reaches C_J. This "efficient" allocation also ensures that the marginal net cost of job-aid is an increasing function of job-aid provided. Appendix 2 to this report (not included) provides the supporting analysis.

After discovering the optimum set of Federal programs in accordance with the proposed method for any given amount of total aid funding, the corresponding total benefits must be computed inclusive of the net external benefits of job-aid and the corresponding total budget cost must incorporate actual rather than net budget cost of job-aid.

Note that the parameter m is not known in advance of the optimization itself. However, as long as the range of total aid fundings and associated budget costs considered is not too distant from the "optimum" level, the marginal value created by a budget dollar in financial aid can be taken equal to the marginal value of a "general" budget dollar.[5] We shall also find that external benefits and losses associated with job-aid derive from economic changes which the Federal Government spends to promote or to restrict under alternative programs. If job-aid costing C produces external benefits b, and alternative Federal programs would produce equal benefits b at a cost A no greater than C_j, an alternative to the above approach is to avoid explicit inclusion of external benefits in the computation and deal with a "true cost" of job aid $(C_j - A)$, i. e. actual cost *minus* cost saving in alternative programs. Under efficient budget allocation, this "true cost" is equivalent to the "net cost" proposed above, i.e. given the marginal benefit m of Federal budget dollars common to all programs, b can be produced by alternative programs at a cost $A = b/m$, so that $(C_j - A) = (C_j - b/m)$.

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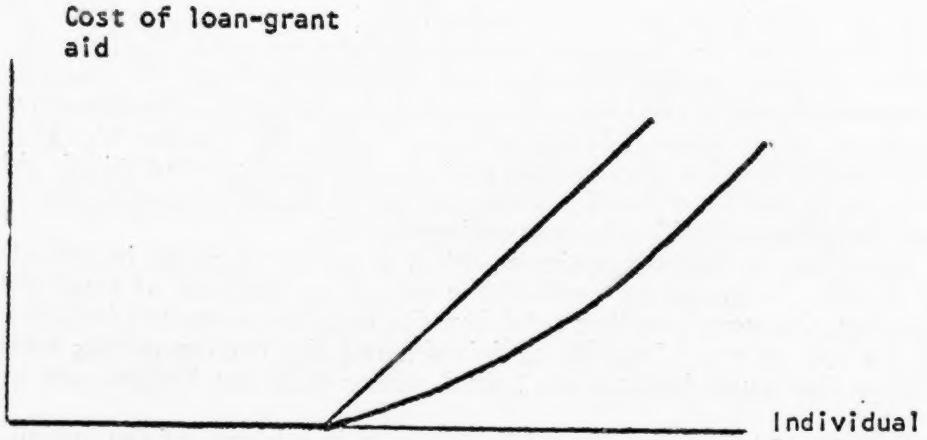
[5] Otherwise, it can be obtained through iteration, first computing marginal aid productivity when optimization neglects external benefits, then introducing this preliminary value in a second computation which includes external benefits and computing the new marginal productivity, finally introducing the new values in a third computation.

(4) *Implementation*

As already suggested, we have insufficient data fully to implement the model just outlined. Lack of information prevails with respect to external losses and benefits of job-aid, as well as concerning the employment cost curves of institutions or institution classes. We are thus in no position to supply a general set of solutions.

However, subsection 3.(4) below establishes at least that the marginal "net cost" of job aid at each institution is positive throughout and always less than one. Furthermore, under assumptions developed in section 4, the curve relating cost of loan-grant aid to amount of *individual* loan-grant funding takes one of the two shapes shown in diagram 4.

Diagram 4



In other words, the cost per dollar of aid funded is 0 up to a critical funding level (unsubsidized loans), then jumps to \$1 (grants) or increases steadily toward one (subsidized loan).

Starting with full loan-grant coverage of the specified funding pattern at the institution, and substituting increasing amounts of job-aid in accordance with the priority rule on page 15, job-aid in individual "packages" will at first be used to replace grant or subsidized loan dolars up to the total so funded or to the maximum tolerable job-aid, whichever is smaller. Loan-grant aid costs will thus fall as more job-aid is substituted until all possibilities of substituting job-aid for grants or subsidized loans have been exhausted. Were substitution of job-aid to be pursued beyond this point, substitutions in individual packages would be for zero-cost (unsubsidized loan) funding and total loan-grant aid costs would remain constant. Diagram 5(a) illustrates the situation showing the cost of loan-grant aid as increasing amounts of job-aid are substituted. The (net) cost of job-aid is shown on the same diagram and the marginal costs (added or saved) of both types of aid are derived in diagram 5(b) as a function of job-aid funded.

Diagram 5(a)

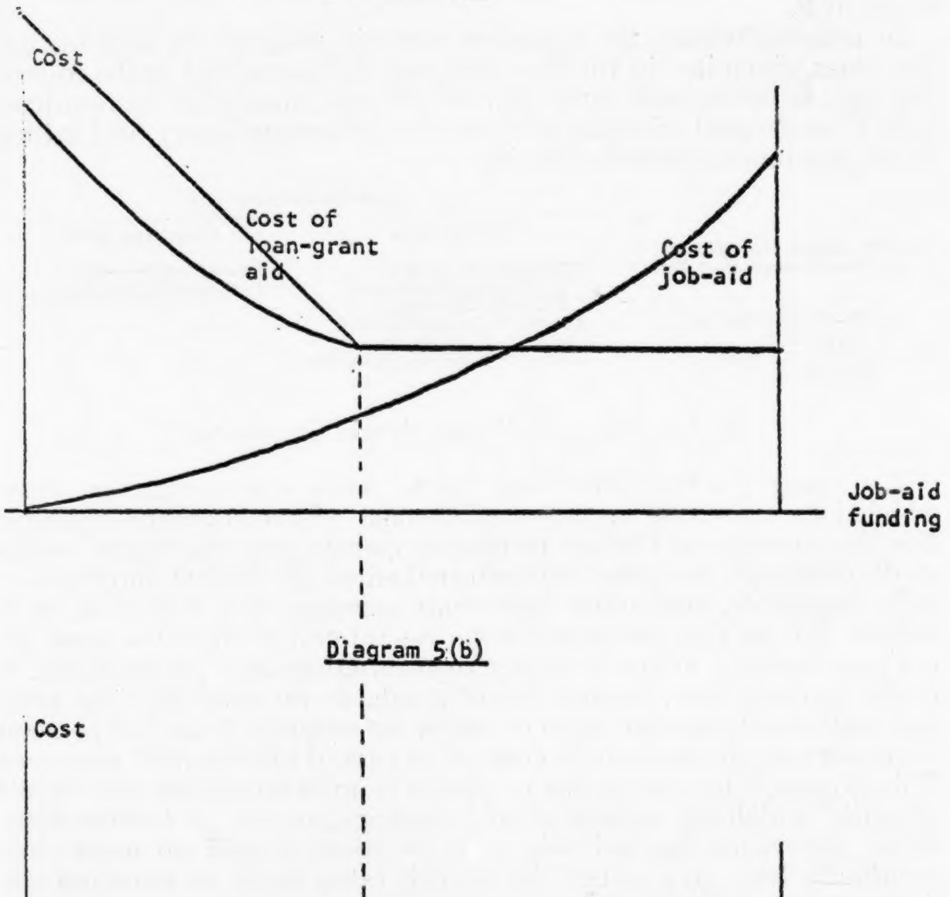
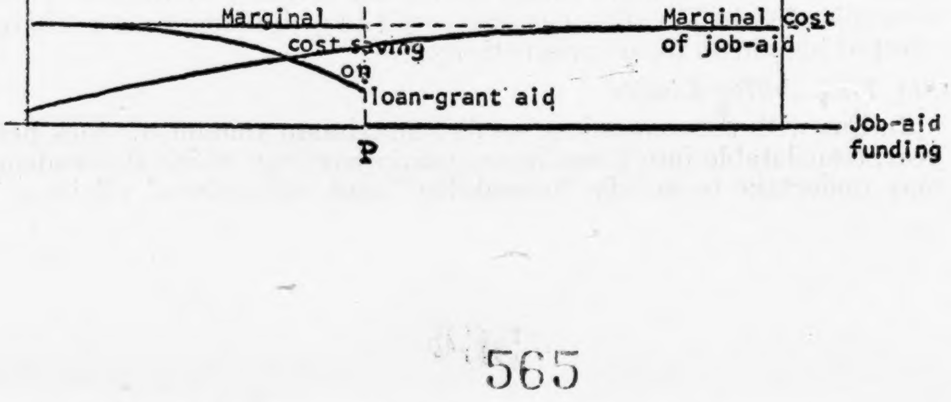


Diagram 5(b)



If the individual "demand curve" takes the special linear form beyond the maximum funded in unsubsidized loans, marginal loan-grant cost saved as a function of job-aid funding falls from 1 to zero at point P. Since marginal job-aid cost stays between zero and one throughout, marginal conditions for cost minimization are fulfilled at P.

If the individual "demand curve" is curvilinear, the intersection of the marginal cost curves may occur left of P, i.e. substitution of job-aid for subsidized loans may have to stop before all possibilities of such substitutions have been exhausted. However, in the absence of better empirical information on the shape of the job-aid cost curve at institutions, we shall proceed on the assumption that the crossing occurs at P.

In practical terms, the minimum cost aid program in each institution class, given its aid funding plan, can be determined in the following way. Given the aid funding need (F) and maximum unsubsidized loan T_L associated with any student (or class of students), and calling T_J the maximum tolerable job-aid,

	Loan-Grant demand curve	
	Linear Form	*Curvilinear Form*
(A) If T_L smaller than F, *and*		
1) $(F-T_L)$ larger than T_J:	Allocate T_J in job-aid, T_L in unsubsidized loan, $F-T_J-T_L$ in grants.	Allocate T_J in job-aid, $F-T_J$ in subsidized loans.
2) $(F-T_L)$ less than, or equal to T_J:	Allocate T_L in unsubsidized loan, $F-T_L$ in job-aid.	
(B) If T_L is smaller than, or equal to, F:	Allocate F in unsubsidized loan	

3. JOB-AID AND WORK STUDY PROGRAMS

We leave out of consideration "pure" work-study programs under which jobs constitute an essential element of the student's training. For the minority of College programs operating on the "pure" work-study principle, we assume the external effects of student employment to be negligible, and count work-study earnings as a deduction from tuition. We are thus concerned with job-aid under which the work experience has only minor relevance to eventual student productivity. It is also assumed that, irrespective of available aid programs, the average student will generate $500 in yearly net earnings from independent (summer) employment, to be counted as part of his "family" resources. This is enough to procure the minimum acquaintance with the "world of work" which all students should, perhaps, acquire at College level. Work experience beyond this point is taken to add no more—and eventually less—to productivity than it takes away by reducing student energy applied to formal studies. This does not mean, of course, that, other equal, complementarity between jobs and formal study programs should not be sought, but we do not expect—considering the manner in which formal College studies are actually conducted—that even this efficient job allocation can result in a significant net positive effect of job-aid on future productivity.

(*1*) *Tolerability Limits*

In line with this reasoning, we fix a maximum amount of work per year, translatable into a maximum yearly earning, which the student may undertake to satisfy "tolerability" and "educational efficiency" criteria. Clearly, this amount varies according to student aptitude, institution attended and type of work involved. However, while the general analysis outlined in section 1 allows for the specification of different work tolerability levels for different students, "average" tolerability limits are adequate for the purpose of examining the implications of alternative aid programs. At any rate, no information appears to have been developed concerning the effect of alternative jobs and job-loads on College performance. (Some available data show a lower performance of full-time entering students who later shift to part-time status, but this is not directly relevant to job-loads of full-time students.)

In the absence of further analysis, it makes sense to take "maximum" specifications in the Federal work-study program (15 hours per week during the school year, 40 hours per week in summer) as a consensus measure of what a full-time student can tolerate. However, this is certainly excessive if all weeks in the year are included, and even more so in terms of the total College experience. We, therefore, conservatively estimate the maximum yearly work-load (for an average student over his College career) at 600 hours, giving a total maximum yearly net earning of $1200. Since all full-time students are assumed to generate $500 a year net earnings independently of job-aid programs, the residual yearly earnings under job-aid are thus $700 only.

(2) *Employment Cost Curve*

Determination of the "employment cost curve" of each institution, or of groups of institutions sharing the same local labor market, is beyond the scope of this study. We can only be certain that costs per dollar of job-aid procured will eventually tend to increase as more student jobs are sought, and that the increase will be sharper in areas where job opportunities are fewer. All institutions have internal jobs which they can parcel out to students at a minimum administrative cost. The Federal Government can also procure temporary jobs within its various agencies without allocating substantial new resources to placement activities; once the internal job pool has been been exhausted, however, placement efforts must be generated at increasing expense to procure jobs in the "outside" market; when traditional placement techniques fail to increase the pool, employers must be induced to provide student jobs through bribes, i.e. the reimbursement by aid agencies of a portion of the salary they pay students. Although the subsidy may not be increased up to the total student pay (a straight grant to the student would then be less expensive), Federal Work-Study programs have provided an example of 90 percent wage reimbursement.

(3) *External Benefits and Losses of Job Aid*

The placement efforts and employment subsidies that underlie job-aid programs create external losses and benefits which we can identify under two headings:

(a) First, there is displacement of members of the regular labor force: given the total of jobs available at any given time, aid programs replace potential takers in the labor force by students. This is a "distributional" effect of the type described under objective (c) in chapter 1, and the losses of benefits associated with it can be measured in accordance with some agreed upon value scale. To the extent that the weight accorded satisfactions experienced by different individuals or groups in the Federal value scale is largely determined by the political power of those individuals or groups, the "worth" of alternative employment distribution patterns may be taken as inversely related to the strength and extensiveness of the adverse reactions they generate. It is then likely that all displacements by students represent a loss, one that is the greater the more adverse the reaction of the regular labor force, particularly its organized membership.

(b) Next is the creation of additional social product, either through the filling of jobs that would go begging in the absence of placement efforts associated with the aid program, or through the encouragement of productive activities which would not be undertaken in the absence of subsidies associated with the aid program. Note that (a) and (b) are not exclusive of one another: the student job-aid may create or fill new jobs and distribute them adversely.

As long as job-aid is limited to ordinary placement activities under competitive conditions, there is a chance that adverse job displacement and productive new employment will balance out with no significant net external benefits or losses. The introduction of subsidies to employers, however, has more serious implications. Whether the job would exist in the absence of subsidies, or whether the subsidy helps create the job, there would be no need to make the subsidy conditional on the employment of *students* if the job were not subject to competition from other seekers. *The use of a discriminating device in favor of students implies displacement of other members of the labor force.* In the first case (jobs in existence without the subsidy), the displacement is necessarily adverse: non-student members of the labor force, particularly those in organized labor, will not accept what amounts to unfair (cut-rate) competition within the established job preserve. Since no benefits are created on the social product account, external effects of job-aid are all on the negative side. In the second case (jobs created as a result of the subsidy), the reaction will be less violent, especially if the activities which the subsidy encourages remain close to education or allied social services. Displacement is thus likely to be less adverse and, in addition, positive external benefits may result from the new activities.

Even when the subsidy induces new activities, net external benefits should not be overestimated. The most tempting area for student employment subsidization is in jobs whose productivity is below the minimum wage and which employers (in the private or the public sector) will only open up if they receive the difference between the wage they must pay and the value they get. Even though the jobs so created fall outside the traditional market, a powerful—or at least, highly "valued"—client group materializes once they are available: the uneducated unemployed. The subsidization of low productivity jobs to fill the gap between minimum wage and productivity is worth considering as a general method of creating gainful employment. However, reserving such opportunities for students rather than unemployed family heads results in a shift of the employment (and, possibly, income[6]) distribution which, in most value scales, would have a negative weight. The loss may be significant and must, in any case, be subtracted from the productivity benefits of job creation.

The indirect financing of worthwhile activities through wage subsidies (as practiced under the Federal Work-Study Program) also has its drawbacks. The adverse displacement generated by student jobs may remain significant (especially if many of the jobs are of the "unskilled" variety), and the resources of benefiting organizations will tend to be used inefficiently. Rather than using their funds (including the subsidy) in the most productive way (which may mean renting equipment and hiring experienced specialists), they must hire students and make the best of what is left after paying student salaries. The benefits will thus be less than what equivalent "unconditional" subsidies would procure, and the inefficiency will be the greater the higher the percentage of salary subsidized.

(4) *The Net Cost Curve of Job Aid*

The analysis of section 1 calls for the introduction of a net cost curve of job aid, where net cost is defined as actual cost *minus* adjusted net external benefits. *Adjusted* net external benefits are themselves calculated through division of net external benefits by a factor m, measuring the marginal benefits of a budget dollar in student financial aid or—for budget allocations close to the optimum—the marginal benefits of a general budget dollar. Adjusted net external benefits can also be estimated (see section 1) as the alternative cost of producing the external benefits—or eliminating the external losses—in existing or potential direct Federal programs. Assuming, that, in the absence of subsidized job-aid, the Federal Government would indeed encourage subsidized activities to the same extent as is done under these programs, and that it must spend identifiable amounts under Poverty, Employment Security, and allied programs to repair the damages of job displacement, we can thus obtain a direct reading of the external net benefit factor without explicit reference to equilibrium marginal aid benefits.

The "efficiency" rule stated (p. 16) specifies that jobs should be developed and distributed in increasing order of their net budget cost per dollar of aid funded, so that both the marginal and the total net cost curve of job-aid are increasing functions of job aid funded. However, concrete rules of job selection for the implementation of this principle are not available in the present state of our knowledge. It is not clear, in particular, where the net costs of job-aid under ordinary placement stand in relation to net costs of subsidized job-aid. The sequential inclusion of jobs in building the efficient "net cost" curve of job-aid must alternate "ordinary placement" and "subsidized" jobs, but we can make no empirical generalization as to the best ordering. From the standpoint of efficiency losses, there is advantage in limiting the proportion of subsidized jobs within any organization, so that constraints on resource allocation remain, in each case, marginal. In other words, subsidized jobs should be spread as thinly as is feasible within the limits imposed by availability of qualifying organizations and administrative efficiency. From the standpoint of minimizing displacement losses, preferences must be given to jobs which are functionally close to educational institutions, are skilled or specialized enough not to be accessible to the uneducated unemployed, and become available at the same point in time as they are allocated to students.

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[6] Unless the unemployed receive adequate income compensation, they are, in effect, made to pay for student support.

In practice, therefore, the only two firm inferences one can make concerning the shape of job-aid cost curves obtaining at institutions are the following:

(a) To the extent that external benefits of subsidized job-aid can be realized at the same, or a lesser, expenditure through other Federal programs (without the inefficiencies inherent in imposing specific employment and wage patterns), we can be sure that adjusted external benefits (b^+/m) are worth no more, and probably less, than the subsidy amount. Since substantial displacement losses (b^-) are incurred in all cases, it follows that adjusted *net* external benefits must be less than the job sudsidy, *and the marginal net cost of subsidized job-aid is always positive.*

(b) However, *marginal net cost must always be less than one*, since a job can always be "acquired" at a cost less than the salary it pays, and we can assume that net external benefits remain positive even at relatively high subsidization levels.

(5) Alternative Budgetings of Job Assistance to Students

The existence of independent Federal programs concerned with "job opportunities" and the potential development of wage subsidy programs in this area suggest alternative arrangements for the administration of student job-aid. The job-aid programs could abandon the management (and financing) of job development, especially wage subsidization, limiting its activities to placement efforts and taking advantage of some regulatory quota of student employment on the part of subsidized public agencies or private firms.

Under efficient Federal budgeting, resource allocation would be the same whether external benefits of Federally subsidized job-aid (assumed generated in competition with other Federal programs) are indeed financed through job-aid or whether they are financed under alternative programs. In the second case, job-aid costs in the student aid optimization procedure are simply computed as the sum of placement costs and adjusted net external losses, i.e. job displacement losses, while the benefits, losses and budget cost of job development (including subsidization) are considered in the optimization of corresponding programs.

While the two approaches lead to the same overall resource allocation, some questions do arise from the standpoint of orderly budgetary procedure. It seems clear that, from the standpoint of student financial aid programs, the important decision (and the area of expertise) is not what activities to support and to what extent, but how to procure student jobs at a reasonable cost. By contrast, work-opportunity programs should, if they have the benefit of intelligent planning, attempt to maximize a weighted sum of objectives which include economic productivity as well as employment opportunities. Programming effectiveness should thus be increased by letting job development be financed and budgeted under relevant programs while limiting student aid programs to ordinary placement activities and the imposition of minimum student employment obligations on subsidized organizations.[7] As already suggested, the cost of job-aid used in optimizing student aid programs would be reduced to the estimated losses from adverse displacement (adjusted by 1/m), and, in the case of ordinary placement activities, placement costs.[8] The amount budgeted for job-aid would only consist of placement cost and the benefits imputed to student financial aid would be the direct benefits *minus* aggregate job-aid losses from adverse displacement (adjusted by 1/m).

4. LOANS AND GRANTS

In line with the general analysis, this section attempts to determine minimum cost programs for the provision of alternative amounts of loan-grant aid funding to individual students. This determination is again dependent on "tolerability limits," which are specified further down.

(*1*) *Analysis*

We specify a series of loan types, each type defined by an expected schedule of student payment obligations over time per $1000 of loan. The amount of loan referred to is the loan principal accumulated by the student up to the point of his leaving College. Payment obligations (as well as costs) are specified for a standard pattern of loan accumulation. Until the second part of section 4.(4), when alternatives are considered, *it is assumed that the time discount rate of Federal budget dollars is equal to the competitive commercial rate of interest on* (*guaranteed*) *student loans.*

All loan types stand between the following two limits:

(a) the strict "commercial loan," repaid at a competitive interest rate by the recipient. At the assumed budget discount rate, the budget cost of a "commercial loan" funded out of the Federal budget is zero.

(b) the outright grant, funded at no cost to the receiver but carrying a budget cost equal to the full amount of the grant.

Intermediate types divide the cost between the aid agency (as lender or subsidizer) and the student borrower.

The analysis is conducted in terms of single loan types and grants, i.e. the student will get all his loans under one loan type (i.e. a given expected repayment schedule per $1000 taken) and may also receive an outright grant.

For each loan type, by reference to repayment tolerability criteria, we can specify the maximum amount which a student can take with tolerable repayment obligations. It is practical to decompose the loan type classification by loan "class" (NDEA, guaranteed subsidized loan, etc., which we identify by numerals I, II, III, etc.) and level of subsidization. For each class, we can then draw the following schedule:

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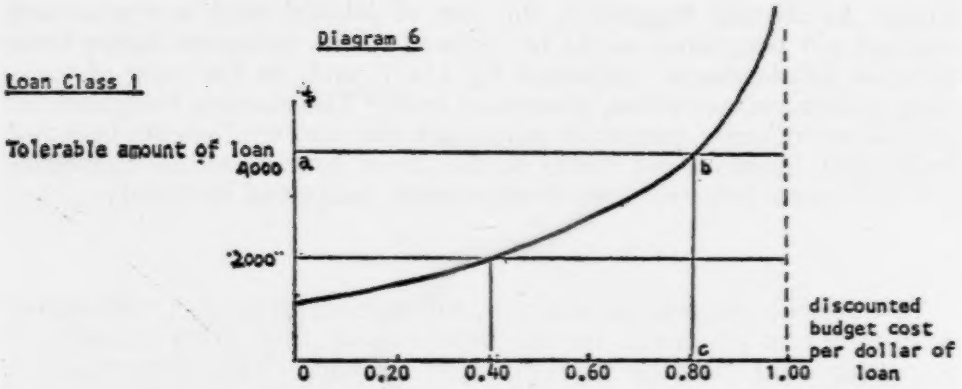
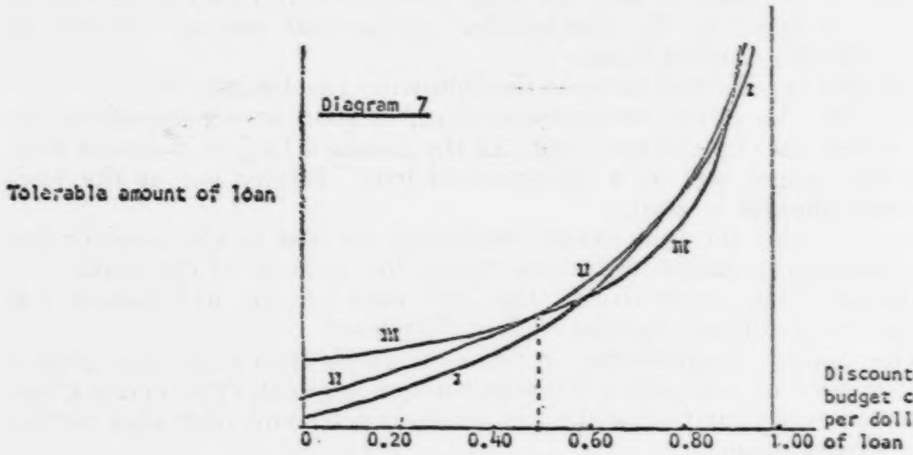
[7] Orderly and efficient budgeting is not the only advantage of the proposed separation of job-aid from job development. Even if program budgeting remains formally accurate, those who discuss or argue budget items in the political arena are not likely to take full account (if any) of benefits and losses external to the main purpose of a program. In terms of the political process of planning, therefore, there are obvious advantages in adopting the proposed budgetary redistribution.

[8] In the latter connection, it should be noted that some minimum placement (administrative) costs remain even when jobs are supplied through imposition of student employment obligations; they are neglected for analytical purposes but should be included in cost computations.



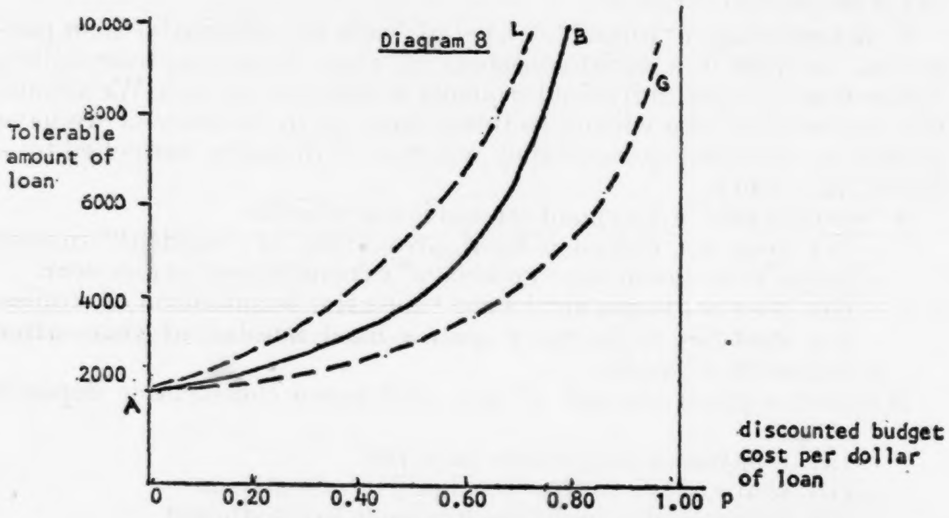
The curve describes increasing amounts of loan which the student will take (find tolerable by our standards) for increasing levels of subsidization translating into increasing budget costs per dollar of loan. The curve shoots up to infinity for totally subsidized loans (grants), and starts at a low but positive level for strict commercial loans.

A similar curve for the other classes of loans can be superimposed on the same diagram, giving (as illustration) the picture below.



The efficient curve is the upper envelope of the three alternatives, showing the maximum tolerable funding to be achieved at various discounted budget costs per dollar of loan. In the illustration, Class III loans are efficient for levels of cost up to .50 per dollar of loan, and Class II loans are efficient for levels of cost beyond .50. It is not unlikely, however, that we shall find the same class of loans efficient at all cost (subsidization) levels.

The next step, then, is to determine the *least costly* loan type, or loan type-grant combination, to provide any given student with his assigned aid funding (net of work-study contribution), in a manner which is tolerable by his own and society's standards. In diagram 6, the cost of funding $4,000 through a single loan type is shown by the area of rectangle 0 a b c: a cost of 0.80 per dollar loaned must be assumed by the aid agency to provide the student with $4,000 under tolerable repayment conditions. It will be seen, however, that a combination of \$2,000 provided under tolerable conditions at a cost of 0.40 per dollar, and \$2,000 outright grant will cost $(2000\times0.40)+2000=2800$ instead of the $4000\times0.80=3200$ with just the one loan type. It is apparent, therefore, that specific combinations of loans and grants may be required to minimize aid cost in funding any given amount of aid under tolerable repayment conditons.



Among all the shapes which the "demand curve" in diagram 8 can assume, the simplest and, as it turns out, most relevant one is such that the tolerable loan amount is inversely proportional to $(1-p)$, where p is the budget cost per dollar of loan. If this relation holds, each dollar of loan beyond the amount, A, tolerated in the absence of sudsidy (zero budget cost) adds one dollar to the budget cost. Thus, any combination of grants and loans summing up to a given total (D, larger than A) has the same cost. In particular, the cost of providing D through an unsubsidized loan, A, and a grant $(D-A)$ is the same as the cost of providing any other tolerable combination.

The curve AB, in diagram 8 is of the special type just described. Most variations of interest involve curves that are consistantly steeper than AB, such as AL in diagram 8, or consistently flatter than AB, such as AG in the same diagram. In the first case, loans are preferable to grants at all levels of funding, while in the second grants are preferable to loans for the financing of aid beyond the amount of loan, A, tolerated at zero budget cost. For more complicated specifications of the demand curve, the optimum allocation may consist of a specific amount of subsidized loan and a specific complementary grant.[9]

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[9] Call L the amount of loan tolerated and p the discounted Federal cost per dollar of loan. The schedule in diagram 3 (or 2) is expressed as:

$$p=g(L)$$

The cost of funding an amount D of aid through L in loan and D-L in direct grant is $C=(D-L)+L\,g(L)$. This is minimized for

$$dC/dL=-1+L\,g^1(L)+g(L)=0,\text{ or}$$

$$\frac{g(L)}{Lg^1(L)}=\frac{g(L)}{1-g(L)},\text{ if the convexity condition:}$$

$$\frac{d^2C}{(dL)^2}>0,\text{ or }\frac{g^1(L)}{Lg^{11}(L)}>-\tfrac{1}{2},\text{ is satisfied}$$

It is of special importance to note that *discriminatory pricing in relation to size of loan* is essential to the cost efficiency of loan grant aid: The subsidy, which is zero for financing needs less than the maximum tolerable loan in the absence of subsidy, must increase progressively (in accordance with the "demand" curves) as the amount of loan offered in the individual aid package increases.

(*2*) *Tolerability Criteria*

In determining a "tolerable" level of loans for alternative loan programs, we refer to a social consensus of what constitutes tolerability, rather than to what individual students would view as such. We assume that students will be willing to incur loans up to the amount we have defined as tolerable, and that they will not—will not be compelled to—exceed this limit.

A "comfortable" repayment stream is one which—

(a) does not exceed a fixed proportion of "residual" income (income after tax *minus* "necessary" expenditures) in any year.

(b) does not begin until some time after termination of studies

(c) stretches to no more than a fixed number of years after termination of studies

Whether a given amount of loan *will* prove comfortable depends on—

(a) repayment obligations incurred
(b) shape of the future "residual" income stream
(c) future credit conditions available to the student

While the first element of the comfortability prediction is known to the student at the time of his undertaking the loan, the second is only available as a probability distribution and the third is, to a large degree, tied to the second. What must be found "tolerable", therefore, is the set of probabilities of alternative outcomes, with the understanding that one's actual future income stream may or may not meet the "comfortability" conditions.

A complete analysis of tolerable loan levels in terms of these variables has not been attempted. We neglect future credit possibilities and propose a single "common sense" solution based on two broad classes of alternatives:

Given the residual income stream *expected* (i.e. viewed as average for his training) by the student:

(a) If loan obligations are unrelated to *actual* residual income received, the amount of loan is calculated so that repayment will be "comfortable" in terms of a residual income stream *less* than the expected residual income stream (protection against risk of low income). We refer to this corrected income as "strategic" income.

(b) If loan obligations are flexibly adjusted to *actual* residual income in any year, and if repayments can, in no case, continue more than five years beyond the "comfortable" period, the amount of loan is calculated so that repayment will be "comfortable" in terms of the expected residual income itself, i.e. expected residual income is also the "strategic" income.

The specification of a fixed maximum annual repayment stream is quite rigid: as we shall see, it leads directly into the special form of the "demand" function for which any efficient combinatoin of tolerable loan and grant has the same budget cost. Both the student and the social consensus would consider comfortability trade-offs between size of yearly payments and length of payment period, as well as between amount of loan during College years and size or length of payments in the years beyond. Until a better analysis can be made, however, a fixed repayment stream in relation to strategic income may be used to approximate tolerability limits at all levels.

Note that uncertainty exists not only with respect to income stream beyond the planned course of study, but also with respect to the course of study itself: students will drop out, transfer to different programs, change their minds about continuing to graduate school. These eventualities ought to be taken into account in developing borrowing strategies. However, our analysis concentrates on two student archetypes (4-year and 6-year continuous full-time study) who (a) attach a probability of one to completing their intended cycle of studies and (b) exactly fulfill their plans. Given the set of least-cost loan-grant financing programs for these categories, it is assumed that its extension to others will provide for their aid funding at very near minimum cost.

The problem of female college students, whose income expectations are far below those of men (mostly because of low labor force participation), has received much attention in at least some of the recent loan program proposals. The assumption made in the present study is that women college graduates will either live independently and earn a fulltime-income—in which case their position will be similar to that of male college graduates—or earn sufficient income, before and in the years immediately following marriage, to repay their loans without eroding the basic "family" income generated by their husband. This means that male and female students can determine their loan tolerance independently of marriage plans, by strict reference to their own income expectations. While the loan decision model outlined above applies only to main family earners (i.e. to males and independent females), the least controversial approach to female financing is to extend loans to them on exactly the terms which have been found optimum for men, the expectation being that they will comfortably discharge their obligation out of a regular career income (if independent) or marginal earnings of their own (if married).

(3) *Empirical Formulation*

Residual income and comfortable repayment stream.—Residual income and comfortable repayment streams were derived for two male student archetypes (4-year and 6-year continuous full-time study) in terms of expected income.

The expected income stream of the 1967 male freshman cohort was obtained, for each student archetype, by reference to median income levels by age group and years of college education in the 1960 Census, after adjusting by an annual money income growth factor through 1985.

Residual income was then defined as the portion remaining after payment of taxes and the incurring of average consumption expenditures. Average consumption expenditures were taken to represent 90% of family after-tax income, in the relevant range, in accordance with B.L.S. findings (1960–61 Survey of Consumer Expenditures).

Finally, considering that part of the "residual" income should be available for securing life insurance, providing emergency funds, etc., ¾ only of this residual was counted each year as constituting a "comfortable" level of loan repayment. In the end, therefore, the average "comfortable" repayment amount was set at 7.5% of after-tax income.

The maximum comfortable repayment stream is shown in diagram 9 for each category of students. It begins one year after the assumed graduation year and continues for ten years. Since the stream is based on *expected* incomes, it requires correction if the "strategic" income relevant to decisions is less than expected income, as in the case of fixed obligation loans.

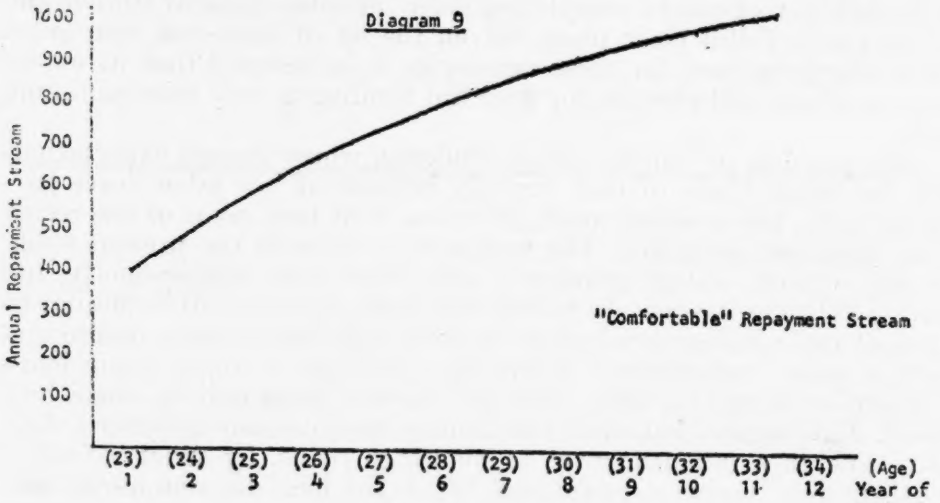
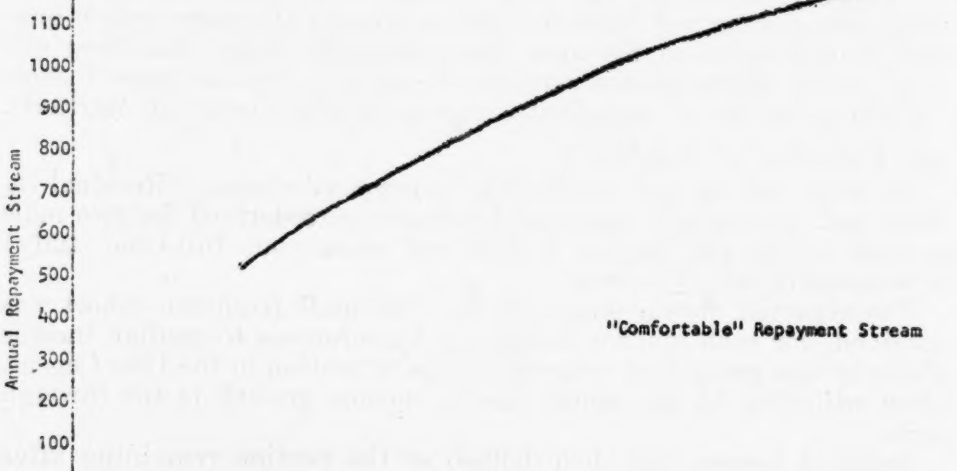


Diagram 9

Borrower--4 years of College



Borrower--6 years of College

The choice of a ten-year period for comfortable repayment was dictated by the need for meaningful comparisons between NDEA loans, repayable in ten years, and other types of loans. The author views fifteen years as a more appropriate time span, since it leaves enough of a breathing space before the college graduate must begin the partial financing of *his* children's college education. If social consensus is to be judged by expressed positions of a majority of the writers on the subject of student loans, it would appear that preference exists for long repayment periods, stretching all the way to forty years.

Maximum college loan demand under "tolerability" constraints.—Given the maximum comfortable repayment stream, it is possible to determine what total level of loans could be amortized under varying assumptions as to repayment schedules, cancellation provisions, and degree of interest subsidy. Three loan program classes were considered, the first and third under five alternative levels of interest subsidy.

(a) Insured, fixed obligation loan program, with repayment over ten year period.

(b) The current NDEA loan program.

(c) A program under which annual repayment is fixed at a given percentage of residual income per $1000 or loan.

The maximum amount of non-burden loan was then calculated under every program option for each class of borrowers (4-year and 6-year continuous study) and, in the case of NDEA, those teaching immediately following graduation so as to obtain 50% cancellation (see Table 2). For computation purposes, students were assumed to make single yearly repayments at the mid-point of each repayment year (September), the first repayment falling on the second September following termination of studies. It was also assumed that students planning on a six-year course would compute their maximum burden on a six-year pattern and take 4/6 the total in college loans. The interest subsidy was applied to an assumed commercial rate of 6%, based on the increasingly untenable expectation of a return of the rate structure to pre-inflation levels.

Since, under all classes of loans considered, repayment obligations are strictly proportional to the size of the loan, the procedure for identifying the maximum amount of loan tolerable was standardized as follows:

(a) In the first step, annual repayments under the loan class were computed for $1000 of loan.

(b) Annual repayments for $1000 were then compared in each repayment year with the "comfortable repayment stream" (adjusted for "strategic" income in the case of fixed obligation loans), so as to determine the lowest ratio of comfortable repayment to payment per $1000 in any year. The corresponding number *times* 1000 is the largest amount of loan that the student can afford without his repayments ever exceeding the "comfortable" level.

It is clear that, of two streams of payments per $1000 of loan averaging the same amount, the one which most closely follows the pattern of the "comfortable repayment stream" will permit the largest borrowing. If the repayment pattern is flat (equal installments), the maximum yearly amount which the student can enjoy will be *lowest* comfortable repayment occurring in any year of the repayment period. Because of the extreme "inefficiency" of such patterns, the tolerability criterion was bent in their case and repayments were allowed to exceed the comfortable total in the first repayment year.

Maximum tolerable loans under alternative programs; "strategic" adjustment:

(a) NDEA

The major features of NDEA loans are—

(1) Full interest subsidy while the borrower is a full-time student.

(2) Interest subsidy on post-school years that brings the effective interest rate charged down to a predetermined level.

(3) A repayment schedule covering 10 years, without any reference to actual future incomes.

(4) A yearly cancellation provision for Borrowers employed as full-time teachers.

The analysis of NDEA loans was limited to one subsidy option, i.e. one under which the effective rate of interest to borrowers in post-school years is 3%.

Repayment was assumed to be in 10 equal yearly installments (model I in NDEA guidelines). In terms of repayment required per $1000 of loan in the first years of repayment, this is mid-way between alternative I–A (10 equal repayments of principal plus accrued interest) and alternatives of type II, III, IV, in which payments increase from the first to the tenth payment. A student bent on reaching the maximum loan he can tolerate would thus opt for one of the graduated repayment plans. The choice of I–A by a majority reflects, on the one hand, the fact that most students do not attempt—or are not permitted—to seek as much loan as they can tolerate, and, on the other, a "banker's" attitude on the part of college officers which discourages delaying of repayments.

Assuming that students are encouraged, rather than discouraged, to opt for one of the graduated loans, and that NDEA funds are expanded, the amount of loan tolerated would still be less than the maximum tolerable in terms of expected income. The reason, already given, is that students must hedge against the possibility of their income (or the avalaible "residual") being below expectations, and thus refer to a "strategic" income stream below the expected stream. For this reason—and somewhat arbitrarily—we take the amount found tolerable by reference to expected income under "intermediate" plan I as an estimate of the amount actually tolerated under a mix of more efficient payment plan but reduced "strategic" income stream.

(Note: Tolerable loan amounts under the maximum 50% teacher cancellation were computed on the assumption that the student maintains eligibility for five years following the end of his full-time student status.)

(b) Insured, Fixed Obligation Loan Program

Taking the 1968 Federal Guaranteed Loan Program as an example, the major features of an insured, fixed obligation loan program are—

(1) Full interest subsidy while the borrower is a full-time student

(2) Fixed interest subsidy in post-school years deducted from the regulated commercial rate charged by the lending institution.

(3) A "commercial" repayment schedule covering up to 10 years without any reference to actual future incomes

(4) An insurance fee paid as an added interest charge

Under the 1968 version of the Federal Guaranteed Loan Program, interest subsidization is limited to students whose adjusted family income is less than $15,000. This feature, however, is best treated as an eligibility condition for the program as described. The performance of this system was calculated for all possible levels of interest subsidization, as well as under cancellation of the full subsidy available during school-years, but without incorporating the guarantee fee. For the reasons already outlined by reference to the NDEA program, repayment was assumed to be in ten equal yearly installments and no reduction for "strategic" income was made in calculating tolerable loan levels.

(c) *Percent-Residual-Income Repayment Programs*

The percent-residual-income repayment program (P.R.R.) sets no time limit on repayment, but the required percentage of after-tax income to be paid each year per $1000 of aggregate loan is so calculated that the loan is redeemed in 10 years when income follows the expected patterns. (As indicated earlier, 10 years are substituted for a "preferred" 15 year period so as to provide a more telling comparison with existing loan programs). Students whose income exceeds the average will pay higher yearly amounts, and thus extinguish their loan in less than 10 years. (Any student can, of course, repay more than the required amount in any year and thus accelerate redemption). Students whose income is less than average will pay lower yearly amounts, and thus extinguish their loan in more than 10 years However, the loan is extinguished in any case after 15 years (20 years if the preferred base period of 15 years is used), so that borrowers with extremely low incomes would fail to repay in full.

Depending on the level of interest subsidy and on the expected income stream (4-year education or 6-year education), a different repayment percentage must therefore be set for four-year and for six-year students, and that percentage must also be adjusted to the contemplated level of interest subsidy.

For any level of interest subsidy—and, as will be seen, aid agency cost per $1000 of loan—the tolerable amount of loans is much higher under a P.R.R. program than under straight annuity repayments. The reason is simply that the latter system "wastes" potential non-burden repayments beyond the second year. To take as much loan as he can under P.R.R., the straight-annuity student would have to let his repayments exceed what we have defined as a "comfort level" over the first four-five years of his 10 year repayment period—a condition that some may view as tolerable but one which is certainly less so than P.R.R.

The other merit of P.R.R. is that, even though the amount of loan undertaken by the student is based on his expected income, what he will repay annually will be proportional to his *actual* after-tax income, i.e., no "accidental" burden can arise. Given this security, the tolerable loan amount can be computed in relation to expected income, without discount for risk. Note that required repayments are expressed as a percentage of after tax income (gross income *minus* Federal income tax, *minus* all taxes deductible under Federal income tax regulations) per $1000 of aggregate loan. To limit the chances of accidental burden further, deductions from gross income should include not only taxes but also dependency allowances and medical expenses deductible under Federal income tax regulations.

The P.R.R. model allows for infinite variations. Three of the more developed plans are those of William Vickrey, ("A Proposal for Student Loans," in *Economics of Higher Education*, Selman J. Mushkin, ed.), Arthur Beroz, (*High Cost of a College Education*, unpublished manuscript) and The Panel on Educational Innovation, chaired by Professor J. R. Zacharias, with further elaboration by MIT economists.[10] Beroz proposes to adjust both annual repayment levels *and* interest costs to actual income. He does so by setting an "absolute" liability at graduation, equal to the sum of repayments on a 4%-10 year-equal installment amortization of accumulated loans, and treating that sum as an interest-free obligation. Given his P.R.R. repayment formula, those with income equal to the expected stream repay in approximately 10 years at an effective interest of approximately 4%, those with high incomes repay in less than 10 years at an effective interest larger than 4%, and those with low income repay in more than 10 years at an effective interest below 4%.

The P.E.I.–M.I.T. Plan works on a somewhat different principle, in that it sets a fixed repayment period in the 30–40 year range, with an opt-out provision allowing earlier stoppage if payments to date cover the loan at some pre-determined interest rate. The average interest (or rate of return) received by the "Opportunity Bank" on its loans is necessarily lower than the "opt-out" rate, since no borrower maintains payments unless his effective interest charge is less than the opt-out rate. The opt-out rate itself cannot exceed commercial rates since all "confident" students with parental credit would then prefer the commercial loan market and only leave born "loosers" as Bank clients. It follows that the average interest returned on the opportunity Bank's loans must be substantially below commercial rates, i.e. the system requires an interest subsidy of the order of 2% or more. This subsidy supports the least successful graduates, while those with high incomes pay the opt-out rate. Because of this graded subsidy in accordance with future income, difficult problems of equity and assessment arise, especially concerning the treatment of women's debt and income. These are avoided in the formula proposed above, since the expectation is that each borrower (with exceptions at the lower fringe of actual incomes) will repay fully, albeit over different time periods, at an interest which, whether subsidized or not, is fixed at the initiation of the loan.

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[10] Karl Shell, Franklin M. Fisher, Duncan K. Foley and Ann F. Friedlander: *The Educational Opportunity Bank: An Economic Analysis of A Contingent Repayment Loan Program for Higher Education.* Working Paper of the Department of Economics, MIT, 1967.

The budget cost of alternative loan programs.—For each of the alternative loan programs discussed above, and for each class of borrowers (2-year and 6-year continuous full time study), a budget cost per $1000 of loan was derived (Table 1). The following assumptions were made:

(a) For computation purposes, the aggregate loan was assumed to be made in equal installments each school year, each installment being paid the student on September 31 at the beginning of the school year. Students were assumed to repay, on the average, in ten yearly installments, the first installment being paid exactly two years after the last loan installment is made (in the middle of the first "repayment year") and the nine remaining installments at one-year intervals.

(b) The rate of discount on future budget dollars was set at the same level as the assumed commercial interest rate on loans, i.e. 6%. The budget cost of a student's aggregate loan was computed in terms of budget dollars in the year of his entering college—since Federal decisions concerning financial aid are generally considered in terms of entering freshman cohorts. The budget cost was simply computed at the discounted sum (6%) of Federal outpayments (loans or subsidies) minus student repayments to the U.S. Treasury.

(c) We neglected costs incurred on the Death, Disability and Bankruptcy account (amounting to less than $2 per $1000 under NDEA) and, where relevant, costs of loan insurance (by whomever borne). In the percentage-of-residual-income repayment model, the cost incurred on the account of low income borrowers benefiting from the payment cut-off was also neglected.

(d) No provision for administrative costs was made, although it is recognized that such costs could vary significantly between programs used.

TABLE 1.—*Discounted cost of loans to loan-aid agency per $1,000 of loan*

	4-year borrower	6-year borrower
Insured, fixed obligation loan—10-year repayment:		
No interest subsidy	0	0
Interest subsidy while in full-time study and 0 subsidy in repayment period	$126	$162
Repayment period:		
1 percent	164	195
2 percent	200	228
3 percent	235	259
4 percent	269	290
5 percent	303	320
6 percent	335	348
NDEA loan program:		
No cancellation	235	259
50 percent cancellation	634	----------
Percent of residual income repayment:		
No interest subsidy	0	0
Interest subsidy while in full-time study and 0 subsidy in repayment period	126	162
Repayment period:		
1 percent	168	199
2 percent	211	235
3 percent	253	271
4 percent	292	305
5 percent	328	338
6 percent	361	371

Maximum tolerable loan in relation to aid agency cost per dollar of loan.—As a final step, the cost to the aid agency per $1 of loan was related to the maximum amount of college loans which a student could afford (find tolerable by our standards), for each class of borrowers. This was done at first for each loan program class (varying interest subsidy), and corresponding curves are shown in diagram 10. The upper envelope of these curves shows the maximum tolerable amount of college loan at each aid agency cost when all program possibilities are considered.

While computations in table 2 concern only sets of interest subsidy between 0 and 6%, there is no reason, in principle, why the subsidy should not exceed the rate of interest. *This simply means that the subsidizing agency helps borrowers repay some of the principal over time.* Accordingly, the curves in diagram 10 were extended beyond the point reached at full subsidization of interest, representing subsidization of principal through "negative" interest charges to borrowers.

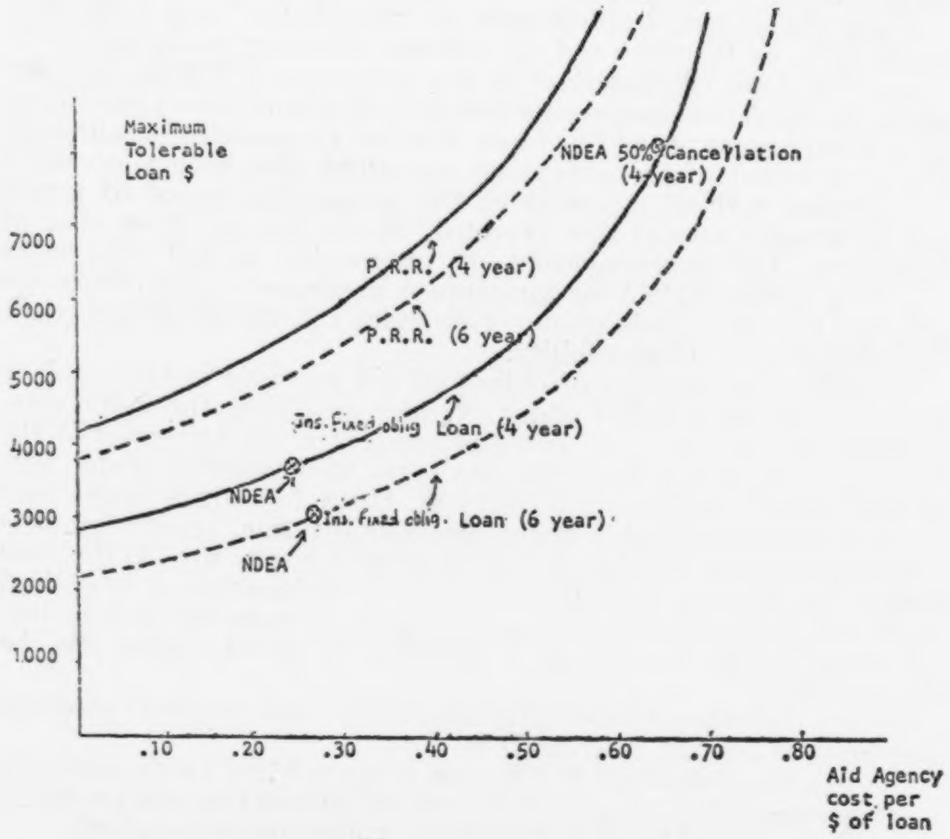
Note, that, since four-year and six-year (graduate school bound) borrowers are not distinguishable at the start of their college career, the terms of "college" loans must be fixed by reference to "four-year" schedules of aid agency costs and tolerable amounts. Those going on to graduate school are allowed to consolidate both undergraduate and graduate loans under the "six-year" loan terms, and their eventual budget cost per $1000 of loan taken during college is that calculated under six-year loan terms.

TABLE 2.—*Maximum tolerable loans by type of loan and class of borrower*

	4-year borrower	6-year borrower	4 to 6 years
Insured, fixed obligation loan—10-year repayment:			
No interest subsidy	$2,800	$3,470	$2,325
Interest subsidy while in full-time study and 0 subsidy in repayment period	3,240	4,130	2,770
Repayment period:			
1 percent	3,330	4,310	2,890
2 percent	3,500	4,510	3,020
3 percent	3,660	4,690	3,140
4 percent	3,840	4,890	3,275
5 percent	4,000	5,100	3,420
6 percent	4,210	5,340	3,580
NDEA loan program:			
No cancellation	3,660	4,690	3,140
50 percent cancellation	8,190	9,750	6,435

	Percent after-tax income repayment per $1,000 of loan	4-year borrower	Percent after-tax income repayment per $1,000 of loan	6-year borrower	4 to 6 years
Percent of residual income repayment:					
No interest subsidy	1.78	$4,200	1.41	$5,620	$3,765
Interest subsidy while in full-time study and 0 subsidy in repayment period	1.55	4,800	1.15	6,690	4,480
Repayment period:					
1 percent	1.46	5,060	1.09	7,030	4,719
2 percent	1.38	5,320	1.03	7,350	4,920
3 percent	1.30	5,620	.97	7,700	5,165
4 percent	1.22	5,920	.91	8,090	5,420
5 percent	1.15	6,270	.86	8,520	5,170
6 percent	1.08	6,600	.82	8,920	5,750

Diagram 10



(4) *Determination of Least Cost Grant-Loan Combinations*

Given our specification of tolerability conditions, the student taking loans in any one of the three listed categories can determine his stream of repayments under maximum borrowing *independently of the subsidy level.* In the case of PRR loans, this stream is an exact replica of the maximum comfortable repayment stream. In the case of fixed obligation loans paid in equal installments, it is a "flat" stream of yearly amounts equal to the lowest comfortable repayment occurring in the repayment period (or the second lowest if the tolerability criterion is bent as proposed earlier). It follows that the present value of loan which the borrower can afford in a given class is the present value (at 6% interest discount) of this maximum repayment schedule *plus* the present value of whatever subsidy is granted. This present value of loan is the same whether the present value of subsidy is generated through interest subsidy or through straight grants. If, as assumed, the budget discount rate is equal to the commercial interest rate of 6%, the present value of subsidy is also its budget cost and we can state: *At any given budget cost, the same amount of aid funding can be made available under tolerable conditions through an interest subsidy formula, or through a combination of unsubsidized loan and* *grant.* Our assumptions, in other words, lead directly into the special form of the loan "demand function" identified p. 34."[11]

Under the proposed specification of "tolerability" and budget discount rates, we therefore end up with the following conclusions:

(a) The most efficient class of loan programs is P.R.R., i.e., programs in which the repayment schedule is set as a minimum percentage of residual income per $1000 of loan. This is a firm conclusion, although the exact extent of the advantage over alternative programs cannot be specified without estimates of the prospective spread of actual income streams around the "expected" stream for any given class of borrowers. The encouragement of progressive annual repayment schedules under NDEA or guaranteed programs would reduce the gap, but the total elimination of risk under P.R.R. will always result in a higher level of tolerability.

(b) Given any amount of individual aid provided in loans and/or grants, it can be supplied under *tolerable* conditions through a combination of *nonsubsidized loan* and *straight grant* (no grant if the funding need is less than the maximum loan tolerable under zero subsidization) at minimum budget cost. If the funding is larger than the loan amount tolerable under zero subsidization, i.e. if a grant is required, the same aid amount can, in general, be procured at the same budget cost through subsidized loans or a combination of subsidized loans and grants, *but there is no advantage in undertaking loan subsidization* unless benefits of a political or moral nature can be attached to it.

(c) By reference to Table 2, the least costly (and simplest) program to supply loan-grant funding D is

(1) non-subsidized P.R.R. loan of up to $4200 (with minimum required annual repayment of 1.8% of after-tax income per $1000 of loan, shifted to 1.4% if graduate studies are undertaken).

(2) if D>$4200, grants equal to D−$4200. There is no necessity to fix a ceiling to the amount of non-subsidized loan which students must have incurred before being eligible for grants. Students planning on more than four years of study would be subject to the same loan limit, but college loans in excess of $3765 would be cancelled up to a total of $4200−$3765=$435 if the student undertakes two years or more of full time gradute studies.

Clearly, the definition of "residual income" is negotiable, and the maximum level of non-subsidized loan can be modified in the light of more or less conservative judgments. More important, expected income varies according to college attended and aptitude, and the "curve of comfortable annual repayment" is also affected by present family income (to the extent that it secures future obligations). The extent to which a practical discrimination can be operated in these terms will require examination.

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[11] Returning to the symbolism of the previous subsection, and calling L the present value of loans made over the college years, A the present value of the maximum repayment stream, S the present value (and budget cost) of subsidy, we have:

$$p=\frac{S}{L}=\frac{L-A}{L}=1-\frac{A}{L}$$

which is the "neutral" demand function derived earlier.

Alternative assumptions:

(a) *High Budget Time Discounts*

The above conclusions are a direct result of the "tolerable repayment schedule" assumption and of the choice of a budget time discount rate equal to the commercial rate of interest. Conditions leading to a more convex "demand" curve (such as OL in diagram 8) will arise if

(1) some substitution of added comfort during studies for financial comfort in the repayment period is possible, so that the amount of repayments tolerated increases with the level of subsidy, or

(2) the time discount of budget dollars is higher than the commercial interest rate.

In the latter case, student repayments at the commercial rate of 6%, when discounted at the Budget rate of, say, 8%, would not reimburse the Treasury for the cost of an out-of-budget loan, so that the latter would carry a positive budget cost even without subsidization. The more efficient "demand curve," for any repayment system, is thus obtained by inducing *commercial institutions* to do the lending at the commercial rate and limiting Federal participation to interest subsidies and grants. The resulting "demand curve" will rise *above* that obtaining under the original assumptions since the present budget cost of any interest subsidy is now less than before (higher discount). Furthermore, any consideration of grant funding will be abandoned in favor of loan subsidies of equal effectiveness, since the latter's present cost will be less than that of the grant.

In either situation, therefore, *all loan-grant aid funding will be through loans*, under the following sequence.

(1) if the loan-grant need is less than the maximum tolerable under zero subsidization: all funding is through a non-subsidized loan.

(2) if the long-grant need is more than the maximum tolerable under zero subsidization: all funding is through a subsidized loan, *the rate of subsidy increasing with the size of the loan* and *extending, if necessary, to subsidization of loan principal repayments.*

In the case of a budget discount rate higher than the commercial interest rate, lending will be done by commercial institutions under some inducement (e.g. guarantee) of the Federal Government.

(b) *Institutional Constraints*

If, as established, a high time-discount of budget dollars calls for a "guaranteed" Federal loan program under which lending at commercial rates is undertaken by private financial institutions and the Government subsidizes interest at a rate graded with the size of the loan, the need to maximize the efficiency of lending through a P.R.R. system of repayments poses special problems. Most P.R.R. type proposals so far have assumed that funding of the loans would be out of the Federal Budget, on the notion that commercial lenders could not adopt comparable methods of loan repayment. However, it is *possible to conceive of a system under which the Federal Government would receive payments from the student borrower in accordance with a P.R.R. schedule, and make payments to the private lender in accord-*

ance with commercial schedules. The Government would thus act as paying agent and insurer, satisfying both the requirements of orderly commercial lending and those of maximum student aid efficiency.[12]

If there is no possibility of financing a P.R.R. system except from the Federal Budget, and if the time-discount rate of budget dollars is higher than the commercial rate of interest, one or the other system will be preferable, i.e. P.R.R. loans out of the Federal budget if the P.R.R. schedule is sharply more efficient than available commercial repayment schedules and the budget time discount rate is not too far ahead of the commercial loan rate or interest; guaranteed commercial loan program if efficiency differences between repayment schedules are mild and the time discount of budget dollars is very high. Note that the "demand curve" for P.R.R. loans under a budget time discount larger than the commercial interest rate is obtained from the original curve (equal rates) by (1) a translation to the right corresponding to the budget cost of a dollar of loan repaid at 6% but with repayments discounted at (say) 8% and (2) a steepening of the curve's slope corresponding to the larger rate of discount applied to future interest subsidies.[13] The possibilities of the demand curves under each alternative crossing at some point was not investigated; if a crossing can occur, one system would be used up to a certain size of loan, the other beyond.

III. OPTIMUM SETS OF FEDERAL STUDENT FINANCIAL AID PROGRAMS

In attempting to determine the most beneficial set of Federal student financial aid programs for alternative levels of Federal aid cost, reference must be made to additional elements of the behavior, or "reaction function" of institutions. In the first part of this analysis, financial aid to students was treated as emanating from a single pool, under direct or indirect Federal control, and maximum capacities were independently projected for broad classes of institutions defined in terms of fixed tuition and fixed instruction cost. All of these assumptions must be relaxed in the final analysis. Whether offers are made directly to students, or indirectly through institutions, the terms of these offers will generate reactions from students, institutions and outside suppliers of resources, which are not necessarily consistent with original assumptions. Such reactions affect not only the amount and form of student financial aid which non-Federal sources will procure, but also the tuitions which institutions will charge and the capacities they will create at different instruction cost levels. While information is lacking as to the precise form of relevant functions, we must attempt an empirical specification of the problem which incorporates acceptable assumptions and is likely to get us close to the optimum we seek.

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[12] Under a P.R.R. system subject to progressive interest subsidy, the required percentage of after-tax income repaid would increase with the size of the loan taken.

[13] The zero cost loan is that found tolerable at an interest equal to the budget time discount rate (8% in the example).

1. REACTION FUNCTIONS

(1) INSTITUTIONAL BEHAVIOR

In the medium run, the objective of higher education institutions may be described as follows:

(1) In the first instance, maximization of enrollments up to available capacity, subject to some minimum college aptitude being evidenced by all entrants,

(2) if this can be achieved through different mixes of aptitudes, maximization of average college aptitude of entrants.

Constraints under which each institution operates include (a) their secured resources, including recurrent cash income, fixed assets and academic reputation, (b) the offer functions of potential direct subsidizers (including all levels of government) and student aid agencies, and (c) the demand function for their products, which is heavily dependent on policies of competing institutions. Their instruments include the fixing of tuition and other charges to students, together with student financial aid from resources they control, the undertaking of steps conducive to aid offer from direct subsidizers and student aid agencies, and the allocation of resources to specific education processes.[14]

Given the objective, the tuition-financial aid decision is dominated by the enrollment of desirable students, not by "distribution" or "equity" considerations. For any total amount allocated to student financial aid, the best results are produced by enrolling low-need students (or students receiving substantial outside aid) in preference to high-need ones, offering only a modicum of aid to applicants in the lower portion of the aptitude range to which the institution caters (given its "quality" level), and offering aid in excess of "need" to potential entrants in the higher portion of this aptitude range. This is competitive pricing: low aptitude students cannot get more aid except in lower quality colleges (which may compete for them), while high aptitude students are bid for by competitors at prices which must be met. It is clear, therefore, that, unless Federal funds made available for student financial aid under institution control are protected by serious inducements (or regulations) to equalize "need" standards among all enrolled students, student aid resources are not likely to be distributed in the most beneficial manner.

Unless institutions receive a new influx of outside resources, it is difficult for them to improve their competitive positions and reach a higher average aptitude of students. This step upward is conditioned by a rise of instructional quality, and this in turn requires higher spending levels. Attempts at raising the necessary resources through increased tuitions (or reduced financial aid to students) are self-defeating. Unless competitive institutions follow suit (in which case no competitive advantage can emerge), the first effect of the increased net charge to students is a drop in average aptitude: High aptitude students are lost to competing institutions and replaced by eager applicants of lower caliber; if aid is further distorted in favor of high aptitude students, low and middle aptitude pupils are lost and replaced by "paying" entrants of an aptitude never yet tolerated. Were the willingness of higher aptitude students to join an institution only dependent on the quality of its instruction, this temporary depression would soon be overcome. The trouble, however, is that the public criterion of institution quality is, at best, the average success of graduates (mostly, admission to graduate schools) or, at worst, the average aptitude of *entering* students. Under the first criterion (the second would make almost any change impossible), increases in quality of *instruction* only become reflected in higher quality of the *institution* if the aptitude of students is not seriously reduced at the same time. Since non-competitive tuition increases tend, at first, to lower aptitude, the public will perceive a lowering of quality and the expected enrollment of higher aptitude students will never materialize. In fact, the institution may reach a new equilibrium at a lower average student aptitude than before the change.

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[14] Research activities are left out of the analysis.

It is clear, on the other hand, that a substantial increase in available student aid funds from outside sources will make an upward move possible—as long as the same windfall is not shared by all other institutions. Tuitions can then be raised—or institutional aid reduced—without changing the net charge to students and thus without immediate effect on their aptitude distribution. Additional revenues can be spent on improving the quality of instruction and thus of graduates resulting in a rise in the public index of institutional quality and an improved competitive position. Even though the generalization of new outside funding to all institutions in the class will destroy this advantage, the logic of competition is such that each institution will attempt to capture it. The final equilibrium will then entail no change in the aptitude and income distributions of students, but education will be provided at a higher quality level and under increased tuitions.[15]

(2) TUITION RESPONSES AND SOCIAL BENEFITS

Increases in tuition levels (or reductions of institutional aid) in response to Federal financial aid to students need not be objectionable if they are to finance higher instruction costs. Available data indicate that social benefits can be raised as a result of institutional capacity shifts to higher quality education, although benefits are strongly dependent on the location of shifts (quality levels from which improvements are made) and on the student clientele they affect.[16] Such benefits, however, may compete with "student-aid" benefits identified earlier in the analysis, i.e. gains arising from shifts in the income-aptitude composition of student bodies, increases in their level of support, and from capacity shifts *externally financed* under pressure of "aided" enrollments. In fact, "compensatory" tuition increases of the kind contemplated would erase most of those "student aid" benefits, including external (non-student) contributions to capacity adjustments. Since a joint contraint exists on Federal funds available for improving institution quality and for inducing desirable enrollment structures and levels of support, expenditures should be so distributed that benefits of marginal Federal dollars on either account are equalized: clearly, this would not be the case if both objectives are pursued under a program of student financial aid which wholly results in increasing instruction costs and does so indiscriminately.[17]

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[15] We may note that, even if institutions foresee the outcome of this competition and entertain no hope of improving their competitive position, they may still, as a group, wish to raise tuitions and instruction costs: a high average aptitude of students is their overriding objective but, if instructional quality can be raised without any loss of "good students," they are eager indeed to provide that better education.

[16] A. Daniere: *Direct Marginal Productivity of College Education in Relation to College Aptitude of Students and Production Costs of Institutions*, Harvard Institute of Economic Research, Discussion Paper No. 27, May, 1968.

Our plight will be still worse if, as is possible, Federal aid funds trigger tuition increases or reductions in non-Federal financial aid without any change in instruction costs. Whole classes of institutions may simply decide to reduce their fund raising efforts and traditional subsidizers (including state taxpayers) may feel that their responsibility is now discharged by the Federal Government. Reductions in philanthropic or state contributions may generate benefits of a distributional nature (i.e. we may put some value on providing state tax relief and reducing the burden on alumni), but, again, there must be a limit beyond which more would be gained in the form of "student aid" benefits already identified than in the form of State-Federal redistributions.

2. Criteria and Strategy of Benefit Maximization

(1) CONTROL OF INSTITUTION BEHAVIOR AND MAXIMIZATION OF BENEFITS

It follows from the above analysis that Federal programs of student financial aid must include more than a specification of aid funding and contractual obligations by category of enrolled students. Further manipulation of behavior toward increased benefits is possible through making the amount and form of aid conditional on certain actions or practices on the part of institutions and benefiting students.

As a matter of general policy, *the net effect of instruments used in connection with Federal financial aid programs should be to press downward on tuitions and upward on non-Federal financial aid.* This amounts to discounting benefits associated with the financing of capacity shifts (higher instructional expenditures) and with redistributions to the advantage of State taxpayers or philanthropists. Our justification is that, from both the budgeting and administrative standpoints, whatever complement of such benefits is desired could be generated more efficiently through other forms of Federal expenditure (mainly, direct subsidies to institutions). However, efficiency also requires that the policy be subject to certain limitation and exceptions.

(a) It may not be possible to induce desirable shifts in non-Federal student financial aid unless they take the form of increases in *both* tuitions and financial aid. It is generally possible for institutions to extract additional resources from student families without loss of benefits by raising tuitions and complementing student aid in the lower income brackets. These additional resources can be used to increase instructional expenditures or to reduce Federal contributions (among others); in either case, the shift is "efficient" in that additional benefits are generated. While it is not clear that pressures linked to Federal student financial aid programs are the best means of encouraging such adjustments, the least our programs can do is abstain from discouraging them (for instance, through rigid tuition regulation).

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[17] We assume that efficient Federal Budget allocation will require subsidizing capacity changes beyond the level of non-Federal contributions triggered (as a by-product) by the pressure of "aided" enrollments.

(b) Social and political constraints operate in that, for instance, Federal aid must be "equitably" distributed between private and public institutions (the argument whether any Federal aid at all should go to students in private institutions appears to have been settled by default). When this constraint is made effective, maximization of student aid benefits may require that aid be distributed to students in low-tuition public institutions with minimal or zero "student aid" benefits. If so, those institutions may increase tuitions by the amount of new aid and create resources for higher instructional quality without reducing benefits associated with student aid. Under the private-public "equity" constraint, therefore, maximization of benefits may require increased public tuitions.

(c) We cannot attempt to freeze the tuition structure as it now stands, nor can we attempt to modify it in accordance with some predetermined optimum. Many prospective shifts are "legitimate", in the sense that they reflect no attempt at exploiting Federal aid, but simply an independent desire to reach a different set of students or a different level of instructional quality. The original impulse may come from the institution's access to new resources, and it may be followed by increases in tuitions (and financial aid) to take advantage of the improved competitive position. Unless we are ready to go very far in the Federal regulation of higher education, the best we can do is to identify such changes and adjust to them.

(2) OUTLINE OF STRATEGY

In view of the complex interactions we face, we propose a "second best" solution under which:

(a) benefit maximizing Federal programs are first determined for a restricted set of institution behaviors, given a Federal cost limit on student financial aid

(b) Federal programs are redesigned in such a way that the behavior of institutions can only result in benefits greater than those generated under (a).

The implemention of this solution is somewhat tortuous and has not, at this point, been fully developed by the author. In the absence of a rigorous derivation, the following section presents the results of a very approximate solution along the proposed lines. Since the whole field of possible "redesigns" under (b) was not covered, it is obvious that a further and more systematic scanning of possibilities would lead to a better set of programs than the one arrived at.

3. DESIRABLE STRUCTURE OF FEDERAL PROGRAMS

The present analysis is only concerned with general financial aid to College students, i.e. with aid programs in which aid is not granted beyond the estimated financial needs of the student. Within this context, the following structure of Federal programs of financial aid to College students appears desirable.

(1) FEDERAL WORK-STUDY PROGRAMS

The first objective of a Federal work-study program must be to enlist the administrative participation of institutions in promoting and controlling student jobs. The reason is that the establishment of parallel Federal structures dealing with the details of individual student placement would add both to total cost of job-aid and to the Federal share of such costs. In addition to enlisting the services of institutions and inducing maximum institution contributions to administrative (placement) costs, Federal Programs must orient institution efforts and develop job opportunities (through job subsidies or im- intended complement of job-aid at each institution is generated at minimum net cost. (For any enrollment and aid funding structure, the "job-aid complement" is computed as in section 1 of Chapter 11, by adding up amounts of job aid substitutable for grants and subsidized loans.)

Although no empirical information is available as yet, we shall assume that (net) costs of direct job placement per dollar of job-aid procured are less than net costs of subsidized employment, as long as placement is secured at a cost no greater than in local employment security offices. The objective is thus to maximize direct job placement within this cost limit, then to supply subsidized employment at minimum net cost up to the full job-aid "complement" at the institution, while maximizing the contribution of the institution to administrative costs in both direct job placement and subsidized employment.

Clearly, institutions will not be induced to cooperate in procuring the job-aid complement efficiently, or to supply a large share of administrative costs, unless there is a payoff in terms of their own objectives. A major obstacle to creating appropriate incentives is that institutions face a conditional Federal commitment to complement the non-Federal effort toward specified financial aid standards. The best policy for individual institutions is thus to minimize their compatible contribution (and raise tuitions), in the hope that others will satisfy aggregate Federal expectations. The most obvious—and least compulsive—way to overcome this attitude is to tie Federal aid to students at the institution to a minimum compatible contribution on the part of the institution. This, however, implies that it is indeed possible to estimate the total job-aid which an institution can procure, given a specific limit on placement costs and a specific policy of Federal "sponsorship" of jobs (job subsidies or student employment obligations).

While the development of an appropriate formula to this effect is not inconceivable, it is nowhere in sight at the present time. Unless unfair and arbitrary solutions are considered, the only alternative is to reimburse institutions for normal placements costs *and* provide an additional subsidy proportional to placement performance. Actual performance under this direct (and expensive) incentive will then be taken as "the best" institutions can do, and Federal loan-grant aid will be calculated by reference to actual, rather than theoretical, job-aid procured.

A. *Direct Placement*

With respect to direct job-placement, there is need to study the feasibility of establishing norms for placement performance by individual colleges, based on average job vacancies per enrolled full-time college student in the relevant labor market area. If this proves feasible, institutions can be required to procure the jobs on their own, under penalty of loss of eligibility for Federal student aid. On the other hand, efficiency could be increased through the creation and Federal subsidization of special units in local employment security offices, designed to find and develop part-time job opportunities for students in their labor-market area.

If it is not possible to establish fair standards of job placement performance, the only alternative is to provide direct incentives to placement by institutions. The incentive must take the form of a subsidization *greater* than cost if there is to be a positive payoff to institutions. The standard Federal reimbursement to institutions per student-job secured could be made equal to the average placement cost in local employment security offices, plus an incentive subsidy proportional to the job-aid generated.

B. *Federally-sponsored Jobs*

As suggested in Section II, "Federally-sponsored" jobs can be supplied in two ways.

(a) The Federal program may let institutions discover jobs within or without, under broad "social service" criteria, and reimburse a fixed percentage of student salary costs to the employer (College or outside agency). Here again, the preferred situation is one in which a minimum placement performance of the institution can be estimated, given the job subsidy level and the guidelines supplied under the program. The estimation should be made by reference to the volume of "service need" and College enrollment in the relevant labor market area. If this does not prove feasible, the alternative is to provide an administrative subsidy which more than covers the cost of developing and filling student jobs *outside* the institution; there is no need to create special incentives for job creation *within* the college, since the institution does benefit from the subsidization of inside jobs.

With respect to level of subsidization, it is clear that the 90% initially set under the present Federal Work-Study program was grossly excessive. In a majority of cases, a lower subsidy would be enough to induce creation of the job, whether it is generated in non-Federal services or in activities supported by other Federal programs. In the first case, the larger subsidy wastes Federal resources (i.e. reduces the overall efficiency of the Federal Budget), and in the second it distorts the budgetary imputation of costs between "student aid" and other benefits.

(b) For reasons discussed in Section II, there are some advantages in separating Job Opportunity programs from student aid. The alternative to Federal work-study subsidies is the imposition of minimum student employment obligations on social service organizations (including Colleges) receiving Federal support under job opportunity programs. Federal job creation for students would then appear as a by-product of other Federal programs and would not be budgeted under Student Financial Aid. Student employment obligations would be limited to the establishment of student priorities over a specified number of jobs, and the proportion of jobs subject to such priorities would be kept small within any organization. Under this system, the number of "Federally sponsored" jobs in any labor market area would be known, and there would be no difficulty in computing the "expected share" of any institution.

Evaluation of present Federal work-study program (HEA, IV C).—The present program roughly corresponds to programs proposed under (2) (a) above. The encouragement and support of direct placement efforts by institutions has been neglected, and the replacement of job-subsidies by the imposition of student employment quotas in independent job opportunity programs has not been considered. Main weaknesses of the program within its own limits are.

(1) the level of subsidization is excessive

(2) the specification that work—when not provided by the institution itself—be related to the student's educational objectives represents an interference in the operation of institutions, a particularly sensitive one since it dictates educational methodology.

(3) the specification of "equitable distribution" requirements suggests reference to no less than eight irrelevant and inconsistent criteria.

(2) FEDERAL LOANS AND GRANTS

Given fixed maximum capacities by institution class, the objective of a Federal Loan-Grant Program would be to cover at a minimum budget cost the difference between calculated aid funding needs of enrolled students and expected work-study job-aid under plans outlined above, inducing a maximum student aid contribution from institutions and outside sources.

To the extent that the aid program itself may encourage shifts in capacities (particularly through shifts in tuition levels of existing institutions), we must attempt to regulate the allocation of loans and grants so that institution reactions can only add to benefits under the fixed capacity assumption. Although fairly sensitive mechanisms can be developed to that effect, the administrative cost and confusion they are likely to generate forces consideration of less effective, but more feasible alternatives. The plan proposed below gives all students access to Federal loan and grant programs up to their computed need (net of job aid), but

(1) holds institutions responsible for aid packaging in accordance with the efficiency rules developed in chapter 2.

(2) makes Federal aid to students at any institution conditional on the satisfaction of certain financial requirements

A. Optimum Loan and Grant Programs

[for students in eligible institutions]

As already indicated, Federal loans and grants under the proposed programs are administered in part by eligible institutions, in that the latter are responsible for "packaging" aid in accordance with efficient schedules. Appropriate guidelines are made available to institutions by the Federal Aid Agency and some element of control is exercised by the latter on their proper implementation.

Two alternative sets of programs are indicated, depending on whether the Federal budget time discount rate is or is not greater than the competitive commercial rate of interest on loans.

(a) *Budget time discount rate no greater than commercial interest rate.* A loan program should function under a Percentage of Residual Income Repayment formula. While the granting of such loans can remain under institution control (in accordance with Federal guidelines), collection must, of necessity, be a Federal responsibility, and this in turn suggests that funding must be through the Federal Budget. However, feasible alternatives are offered below.

The loans should not be subsidized, i.e. full interest equal to the competitive commercial loan rate should be charged, and there should be no cancellation other than on the Death, Disability and Bankruptcy account. (However, cancellation under P.R.R. when the repayment period exceeds 20 years should be considered.)

Loans should be granted up to $1,000 a year (at present interest rates) with no condition other than full-time College attendance. If institutions and other organizations insist on continuing long-term loan programs (with some subsidization formula) students receiving such loans would (could) reduce their Federal borrowing accordingly.

A Federal grant program should be established to pay students the difference between their "standardized funding need" and the sum of $1,000 plus the job-aid received at their institution. The "standardized funding need" would be computed by reference to family financial data and tuition level, in accordance to standard schedules (e.g. College Scholarship Service). However, Federal grants would be reduced by the amount received from alternative sources (see below).

(b) *Budget time discount greater than commercial rate of interest.* If immediate Budget considerations are paramount, i.e. if the time discount on Budget dollars is high, recourse should be had to commercial lending faculties under some form of Federal guarantee, and a level of Federal interest subsidization that increases with the size of the loan. The interest subsidy should be allowed to go beyond the interest charged and reduce principal repayments if the loan need is large enough.

—In addition, early steps should be taken to explore the possibility of an arrangement by which the Federal Loan Agency undertakes to repay the lenders under a fixed standard schedule and the student undertakes to repay the Federal Agency under P.R.R. The Federal Government would then play the role of a collection agency, guaranteeing lenders a fair return under appropriate repayment terms and collecting from students under P.R.R. at some small annual cost.

—Loans should be granted up to an amount equal to the "standardized funding need" *minus* job-aid obtained through the institution attended. However, loans would be reduced by the amount received from alternative sources (see below).

B. *Conditions for Institution Eligibility*

For students at an institution to remain eligible for Federal aid programs, the following conditions would have to be met

(1) The institution administers aid packaging in full compliance with the Federal guidelines.

(2) Students at the institution receive grants or loans from sources other than the Federal Government so as to reduce the Budget cost of full Federal funding by a specified minimum amount. The specified minimum is the sum of grants actually received by students at the institution from all non-Federal sources in some base year previous to the implementation of the proposed Federal programs. The source of "compensatory" grants and loans may be the institution itself or any outside (non-Federal) agency, but the institution is responsible for making up the difference between outside contributions and what is required to fulfill the condition.

(3) The proportion of instructional expenditures (net of any direct Federal subsidy) represented by tuition receipts does not exceed 60%, or the proportion holding in the base-year, whichever is higher. The objective pursued under this requirement is the prevention of attempts by institutions to shift the burden of financing away from legitimate sources and onto Federal student aid programs. The second alternative under the rule allows institutions to raise tuitions, but only on condition that additional contributions are also drawn from outside sources. This guarantees that (1) tuition rises in response to increased Federal financial aid will increase instruction cost per pupil rather than relieve non-Federal subsidizers, and (2) a brake will be placed on the destruction of "student-aid" benefits through excessive tuition increases.

One difficulty under the "base year proportion" rule is that, given the existing tuition structure, Federal grants or high subsidy loans received by the private education sector would be much higher per student than those received in public institutions. In other words, public institutions would be penalized (through receiving less Federal student aid) for their low tuition policy. It is clear that a Federal system which heavily favors the private sector will not be acceptable, and it is equally clear that large sections of the public higher education sector are most in need of upgrading and least well equipped to raise the necessary resources.

In addition, the charging of very low public tuitions has unfavorable distributional effects, in that it places the burden of education financing on state taxpayers rather than on those who will most directly benefit and can, under appropriate aid policies, shoulder that burden under tolerable conditions. This is why the 60% alternative is made available: it allows low tuition public institutions to raise fees without penalization up to a level which, in terms of present instruction costs, can easily be borne by students with the help of low cost Federal aid programs.

Unquestionably, however, this area of financial control is fraught with difficulties and the proposed set of rules can only be viewed as a tentative solution subject to improvement (or scrapping) on the basis of further analysis and deliberation.

Evaluation of present Federal loan programs.—The division of the Federal loan effort between NDEA, whose loans are funded out of the Budget, and the Guaranteed Loan Program, whose loans are issued by commercial institutions, reveals some ambiguity on the part of Federal decision makers concerning the proper rate of time discount of Budget dollars. The main inefficiencies of the programs are

(1) They do not rely on a P.R.R. repayment schedule, but on standard commercial schedules

(2) Their interest subsidization, except for a rough cut-off at $15,000 income between 3% subsidy and no subsidy under the Guaranteed Loan Program, is not graded in accordance with size of loan.

The joint impact of those two shortcomings grossly inflates the budget cost of loan programs and/or reduces their potential benefits.

Federal Aid to Higher Education Through 1976

*Clark Kerr**

INTRODUCTION

From the beginnings of the Republic, education at various levels has played a vital role in the building of a strong democratic society. Today, as education through high school has become almost universal, as knowledge has expanded, as the professional and intellectual demands of modern society have become ever more complex and demanding, the Nation has looked increasingly to America's colleges and universities to meet many of our most important national needs:

For furtherance of individual aspirations,
For equality of educational and thus economic and social opportunity,
For scientific and technological advances to stimulate economic growth,
For highly trained personnel to serve a complex society,
For cultural enrichment of the quality of life,
And for the ideas so crucial to solution of profoundly complex issues.

What the American nation now needs from higher education can be summed up in two words: quality and equality. Our colleges and universities must preserve academic quality if our intellectual resources are to prove equal to the challenges of contemporary life. And the campuses must act boldly to open new channels to equality of educational opportunity.

CAN HIGHER EDUCATION MEET THESE NEEDS?

Leading spokesmen for higher education have recently expressed serious concerns about whether American higher education will have

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*The author is Chairman, Carnegie Commission on Higher Education. The paper is a summary of the report of the Carnegie Commission entitled, *Quality and Equality: New Levels of Federal Responsibility for Higher Education*, A Special Report and Recommendations by the Carnegie Commission on Higher Education, McGraw-Hill Book Company, Hightstown, New Jersey, December 1968. The Commission is composed of the following members:

Ralph M. Besse, Chairman of the Board, The Cleveland Electric Illuminating Company; Joseph P. Cosand, President, The Junior College District of St. Louis; William Friday, President, University of North Carolina; David D. Henry, President, University of Illinois; Theodore M. Hesburgh, C.S.C., President, University of Notre Dame; Carl Kaysen, Director, Institute for Advanced Study at Princeton; Katharine McBride, President, Bryn Mawr College; James A. Perkins, President, Cornell University; Clifton W. Phalen, Chairman of the Executive Committee, Marine Midland Banks, Inc.; Nathan M. Pusey, President, Harvard University; David Riesman, Professor of Social Sciences, Harvard University; Hon. William W. Scranton; Norton Simon, Director, Norton Simon, Inc.; Clark Kerr, Chairman.

the necessary resources to meet *at the same time* the Nation's needs for protection of academic quality and for expansion of equality of educational opportunity. In January, 1968, the National Association of State Universities and Land-Grant Colleges commented about the response of public institutions to the shortage of resources:

> "To maintain quality, they have raised student charges substantially, turned away qualified students, limited enrollment, and refused requests for urgently needed public service."

Three months later the Association of American Universities declared:

> "American higher education is experiencing critical and widespread financial pressures. Virtually every type of college and university faces a widening gap between annual income and the level of expenditures required to undertake needed expansion and improvement—or even, in many cases, to sustain normal operation."

Four essential factors affect the potential financial strength of higher education: growth in size, growth in functions, rising costs, and sources of funds.

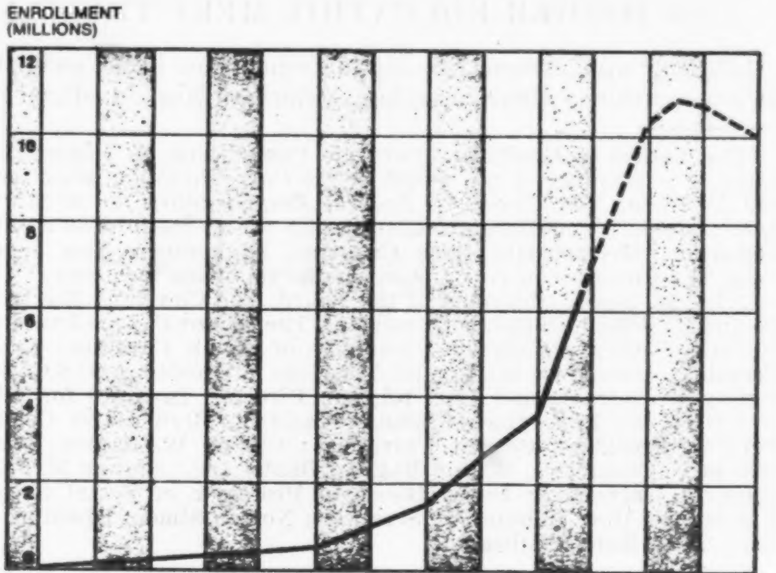
Growth in Size

A century ago, enrollment in higher education in the United States was only about 50,000 students. Today's enrollment is almost 6 million students on a full-time equivalent (FTE) basis. More than half of this growth took place in the decade from 1958 to 1967. A century ago, 2 percent of young Americans entered college. Now the figure is over 40 percent and is still rising. Estimates indicate that enrollment will pass 8 million by 1976, and this figure may well rise to 9 million if vigorous measures are adopted to remove financial barriers for students from low-income families.

Enrollment will continue to rise, but more slowly, after 1976, leveling off toward the end of this century. The heaviest costs of further expansion lie in the years just ahead, when new facilities will be needed for some 3 million students by 1976. To fall short of this goal would be to limit greater equality of access to higher education.

FIGURE 1

Enrollment in institutions of higher education (millions)



GROWTH IN FUNCTIONS

Sheer numbers of students do not, of course, tell the entire story of institutional growth. Colleges and universities have also grown steadily in the number and complexity of functions required by the expansion of knowledge and the needs of society. Instruction has increased in total duration, in curricular range, and in specialization. Research has burgeoned. Graduate and professional programs have multiplied. Institutions perform a host of public services directed toward civic and social problems. And new needs arise constantly: for research on the problems of the cities, for the training of additional doctors and medical support personnel, for postdoctoral training and continuing education in many professions.

These expanding functions have brought our institutions of higher education to a central role in society. But they have also added greatly to the pressures of rising numbers of students and rising costs.

RISING COSTS

The continuing expansion of higher education facilities will be costly in any case, and is made more expensive by rapidly rising costs per student. Total institutional expenditures for higher education climbed from $5.2 billion in 1957–58 to about $17.2 billion in 1967–68, an increase of 231 percent as compared with a 119 percent increase in enrollments for the same period. Expenditures of higher education institutions are expected to total about $41 billion by 1976–77 for a projected FTE enrollment of 9 million students.

It should be noted that institutional expenditures are the major but not the total costs of higher education. Certain government and private expenditures for higher education purposes are not reflected fully or at all in institutional spending data. For example, Federal student aid uder the GI Bill and the Social Security Act and some forms of State student aid go directly to the student. Unfortunately, the determination of the total cost of higher education is difficult and, inevitably, somewhat arbitrary. Data on institutional expenditures, however, are fairly well established and provide a useful yardstick for the measurement of higher education costs. It is the institutional expenditure total that is expected to rise to $41 billion by 1976.

In terms of gross national product (GNP), expenditures by institutions rose from about 1 percent in 1957, when the GNP was $432 billion, to slightly more than 2 percent in 1967, when the GNP was $763 billion. Institutional expenditures will need to be about 3 percent by 1976, at which time the GNP will be about $1,400 billion.

Many factors aside from the general level of inflation have contributed to rising costs per student. Faculty salaries, which had lagged for some years, have been rising faster than the general level of wages and salaries. Graduate work has increased in importance, and it is more expensive. More sophisticated and costly research and teaching tools are required.

For many other activities of society, rising costs are offset in substantial part by accompanying rises in productivity. Unfortunately, higher education has not and perhaps cannot offset its rising costs in this manner. Despite improvements in college management and experiments in programmed learning and other new techniques, no major ways are likely to be found in the short-run which will make it possible to educate more students at the same level of expenditures without lowering academic quality. Studies aimed at long-run improvement in educational productivity should, of course, be vigorously pursued.

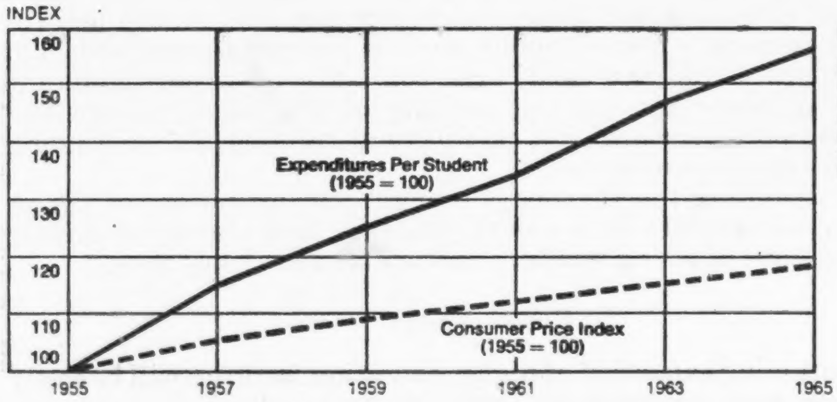


FIGURE 2

Comparative rise of direct educational expenditures per student and consumer price index

SOURCES OF FUNDS

While higher education has long received some Federal assistance, the chief financing burden has been borne by State and local governments and the private sector. But these sources are approaching limits. Many State and local governments whose expenditures for higher education are already large would experience great difficulties in providing the additional support needed, both because of tax base limits and because of other essential needs for public funds. States whose past expenditures for higher education have lagged should, of course, provide substantial additional funds. But State support has been a falling share, and undoubtedly will fall still more.

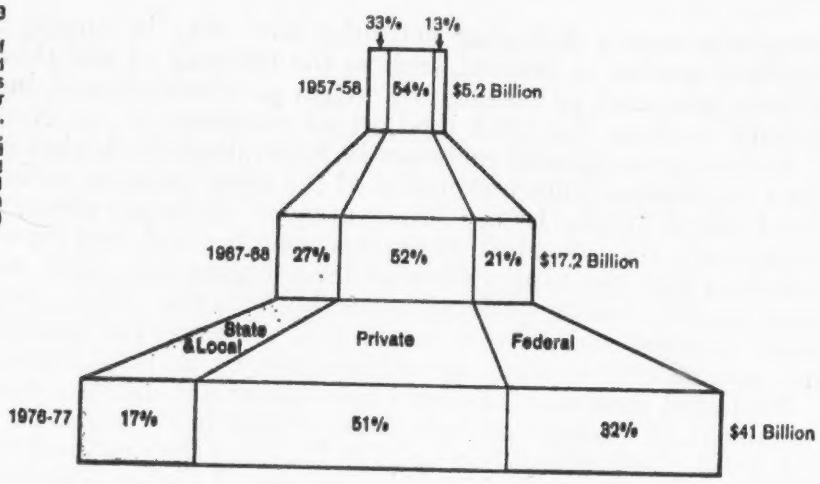
Private resources have provided about half of the institutional funds for higher education in recent years. With expectations of rising per capita income, and with a relatively high income elasticity for educational expenses, private resources should continue to provide half of the expanded financial support—a heavy increase in absolute dollar amounts. It would be unrealistic to assume, however, that the private share can be increased in percentage terms over the next few years.

The Federal Government, with revenue available from the graduated income tax, is the major source now realistically able to raise its general revenues faster than the gross national product and thus to offset the decline in the share borne by the State.

State, local, and private sources combined now pay about four-fifths of total institutional expenditures, and the Federal Government pays one-fifth. While the absolute amounts paid by all sectors must continue to rise substantially, Federal support levels in dollar terms will need to triple in the immediate future. The Federal Government's proportionate share of institutional support will need to rise from about one-fifth at present (almost $4 billion) to about one-third (over $13 billion) of the new total by 1976–77.

FIGURE 3

Sources of funds expended by institutions of higher education, 1957–58, 1967–68, and 1976–77 (based on federal aid proposals in this report)



	1957–58		1967–68		1976–77	
	$ BILLIONS	%	$ BILLIONS	%	$ BILLIONS	%
State and local ..	1.7	33	4.7	27	7	17
Private	2.8	54	9.0	52	21	51
Federal	0.7	13	3.5	21	13	32
Total	5.2	100	17.2	100	41	100

FEDERAL AID IS BOTH ESSENTIAL AND FEASIBLE

The data on growth in size and in functions, on rising costs, and on sources of funds make it evident that a much greater Federal investment is now essential if the growth of higher education is not to be curbed at the very time that the national need is so crucial for our best ideas and intellectual skills and for the broadest possible extension of equality of opportunity.

The severity of the problem is not uniform throughout higher education. Some institutional levels, some geographical areas, some kinds of institutions face more critical financial needs than others. Overall data may disguise the serious nature of the problems for many institutions and students. Capacity not fully utilized in some areas is nevertheless inaccessible to students being turned away from overcrowded local facilities if those students lack the financial means to travel to and live in other areas. Available financial resources at one institution or system are not transferable to others. Improved resource planning on one campus does not help solve financial shortages at another whose resources are already being inventively utilized to the maximum.

Most institutions by now have had to absorb so many pressures that formerly available margins in facilities and resources are depleted. They are now being forced to choose among the alternatives of limiting enrollments, raising tuition fees, postponing expansion and new programs, or allowing quality to deteriorate.

The adverse effects upon national needs are all too clear. Enrollment limitations and higher tuition fees (unless offset by grants and loans) penalize first the very group of students for whom the goal of greater equality of opportunity is intended. Postponing expansions and new programs means deferring activities that may be among the most urgently needed at present, such as the training of additional health science personnel or research on urban problems. Sacrificing general quality weakens the vital intellectual resources of the Nation.

In urging substantial increases in Federal aid for higher education, the Commission is not unmindful of the other pressing national needs for Federal funds. In the broad area of education alone, there are urgent calls for aid at primary and secondary levels and for vocational training. But the Commission believes higher education warrants a high priority among national needs, both because of the specific purposes it serves and because intellectual resources are indispensible to the resolution of so many other high-priority national issues.

Projected growth of Federal revenue would indicate that the net increment to Federal revenue (over "work load" increases in costs) will reach about $70 billion by 1976–77. Thus the proposed increase of $10 billion in Federal aid to institutions of higher education would require only one seventh of the expected additions to available Federal revenues over the next few years for new programs.

FORMS OF FEDERAL SUPPORT

The Commission believes Federal support should be based upon the related concerns of contributions to the national welfare and to the vitality and effectiveness of the institutions of higher education themselves. The forms of Federal aid employed should:

Draw forth rather than merely replace state and private support,

Provide for flexibility and periodic reevaluation for changing needs,

Assist both public and private institutions (for nonsectarian purposes),

Improve equality of educational opportunity,

Rely upon market processes in student choice of field and institution,

Preserve institutional autonomy and integrity,

Encourage diversity,

Provide an incentive for innovation,

Maintain among distinguished institutions a margin for excellence,

Use competitive principles in the support of academic quality, through nationwide competition for fellowships and for instituitional proposals in various special program fields.

In the Commission's judgment, the best immediate means of Federal aid are:

Grants and loans to individual students to move toward the goal of equal educational opportunity.

Support of institutions to meet increased costs of expanding enrollment and to strengthen areas of particular national concern.

Extension of support for research, for construction, and for special programs.

Two other widely discussed approaches are considered as far less desirable than extension of existing programs. One such approach, tax credits to parents of children in college, would not aid low-income families where the need is greatest. Another, general subsidies to the several States, would fail to provide the coordination and perspective necessary to assure expansion of programs of primary national concern.

RECOMMENDATIONS FOR FEDERAL AID

Following are the proposals the Commission believes will best meet the most urgent financing problems of higher education through 1976. No attempt is made here to incorporate or comment upon all existing Federal aid programs for higher education.

STUDENT AID AND RELATED INSTITUTIONAL GRANTS

One of the most urgent national priorities for higher education is the removal of financial barriers for all youth who seek to enroll. A second important priority is support for talented graduate students who can meet the Nation's needs for professionals, specialists, researchers, and college teachers.

The Federal Government presently provides limited amounts of student aid under a number of separate programs. To replace many of these programs (except, of course, for the GI Bill), the Commission proposes an expanded program of grants and loans, a work-study program, doctoral fellowships and other supporting activities. The proposal is based upon these premises:

1. Student aid must be adequate to remove financial barriers.
2. Grants supplemented by work-study payments should be scaled to differing educational expenses at the several levels of study. Junior College expansion should make it possible for most students to attend low-cost institutions near home for at least two years.
3. A loan program should provide greater flexibility in college choice for needy students and provide deferred-payment college financing for all students regardless of need.
4. Maximum flexibility and fullest utilization of aid funds will result if most funds are kept in one national reservoir and granted to individual students who exercise free choice of institution and disciplinary field. For administrative purposes, however, grant payments would be made through the selected institution rather than directly to the student by the government.

Educational opportunity grants. College attendance in the United States today is heavily concentrated among the children of families in the higher income brackets. The financial barriers that limit attendance by the children of low-income families result in a demonstrable loss of national talent. In the highest socio-economic quartile, 19 out of 20 students ranking in the top ability group (the highest 20 percent) enter college within five years after high school graduation; in the lowest quartile, only 10 out of 20 in the highest ability group enter college.

The proportion of Negroes in the American college population is less than half the proportion of Negroes in the population as a whole, and half the Negroes in college attend predominantly Negro colleges.

The higher Education Act of 1965 established a program of educational opportunity grants that provided 225,000 grants in 1966–67. A clear policy to remove financial barriers should provide grants to about 2.9 million students by 1976.

It is recommended:

1. That funding for educational opportunity grants be expanded so that all college students with demonstrated need will be assured of some financial aid for higher education.
2. That grants based on need be available for a period not to exceed four years of undergraduate study and two years of study toward a graduate degree.

Assuming full need, maximum grants would be $750 per year for a student in the first two years of undergraduate study, $1,000 per year for a student in the third and fourth years, and $1,000 per year for a student during two years of graduate study. Determination of need would take account of such factors as total family income over several years, total family assets, and number and ages of children.

(Note: Estimated funding levels for this and the following proposals will be itemized and totalled in the Summary section.)

Supplementary matching grants. A program of supplementary matching grants would encourage institutions to seek additional student aid funds from private, State, and local government sources. These sources provided more than $600 million in student aid funds in 1966–67.

It is recommended:

> That an undergraduate student holding an educational opportunity grant and receiving added grants from nonfederal sources be given a supplementary Federal grant in an amount matching the nonfederal grants but not exceeding one-half of his original educational opportunity grant.

For example, an upper-division student with full need might hold a $1,000 educational opportunity grant. If he were awarded an additional State or private grant of $400, he would become eligible for a Federal supplementary matching grant of $400, bringing his total grant level to $1,800.

Federal scholarship grants to institutions. To provide greater funding flexibility for individual hardship cases, some additional funds should be given to institutions for allocations according to each institution's own definition of need.

It is recommended:

> That each institution be given a scholarship fund for needy students equal to 10 percent of the total sum of educational opportunity grants held by students at that institution.

Work-study program. The Federal Government has helped institutions provide part-time jobs for needy students, during the Depression via the National Youth Administration and in the past several years via the Higher Education Act of 1965. Last year 310,000 students participated in the program, which provides an average of 15 hours of work weekly when classes are in session and not more than 40 during vacation periods. The Commission believes work-study is one of the most valuable forms of student aid. It helps many students to enter and remain in college and to perform tasks important to academic institutions and community agencies.

It is recommended:

> That Federal funds be provided to finance institutionally administered part-time employment for needy undergraduates, who could earn up to $500 per year on campus or in off-campus assignments of educational importance, such as tutorial work.

Counseling and information program. The Federal Government, under the National Defense Education Act of 1958, provides a broad program of guidance, counseling and testing of students at all levels, to identify and encourage able students to continue their education. The Commission believes this program should be further expanded and strengthened, because of the great importance of decisions made at the high school level about college attendance.

It is recommended:

> That the present Federal aid program of guidance, counseling and testing be expanded and that it should include support of research activities to find better ways of identifying qualified students, Federal training courses for high school teachers and counselors to keep them up to date on financial aid and college programs, and support for information centers in metropolitan areas where students and parents can learn of higher education opportunities and career possibilities.

Graduate talent search and development program. Because the Nation's 2,300 institutions of higher education vary greatly in function and in educational effectiveness, some students receive their bachelor's degrees without fully adequate academic preparation for the undertaking of graduate programs. Some of these students come from the very groups in the population that most need opportunities to participate more fully in higher levels of the Nation's work force.

As a partial remedy, the Commission urges that a Federal program be established to help identify potentially able graduates whose undergraduate training may have been inadequate, and to provide up to one year of intensive work to enable these students to undertake their graduate studies more successfully.

It is recommended:

> That certain universities be selected on the basis of program proposals submitted to national panels to undertake specific graduate talent search and development programs, such programs to be federally funded.

Doctoral fellowship program. Various Federal agencies now offer doctoral fellowships and traineeships in some fields to students selected largely on the basis of ability. Because of the great importance of encouraging the most able students to continue their graduate studies at the highest level, the Commission proposes a federally financed doctoral fellowship program based on ability for students in all fields of intellectual endeavor.

It is recommended:

> That a doctoral fellowship program be established with selection based upon academic ability without reference to need, providing

> fellowships of $3,000 annually for a maximum of two years to candidates for a Ph.D. or equivalent research doctorate, the total number of such first-year fellowships to equal three-fourths of the national total of earned doctorates in the previous year.

Half the fellowships would be awarded through national competitions, and half would be granted from allocations to institutions for certain departments or programs designated by national panels of experts. The departments would apply their own ability criteria for selection of recipients.

National student loan bank. Opportunity grants and work-study programs will help remove financial barriers to higher education, but other kinds of student assistance are also needed in a period of rising educational costs. Grant recipients might wish to attend institutions farther from their homes or with high tuitions, at costs greater than opportunity grants can meet. Students from middle-income families, especially those with several children in college, may need financial aid. To meet such needs, the Commission believes it is important to have available a substantial student loan program in which need is not a condition of eligibility.

The National Student Defense Loan program and the Guaranteed Loan program together had outstanding loans of over a billion dollars in 1966–67. The Commission believes these programs are inadequately funded and have certain other drawbacks, such as need requirements and short repayment periods.

What is needed is a much larger loan program of a quite different character—namely, one with contingent repayment provisions under which the borrower contracts to pay back a fixed percentage of this income per $1,000 of debt each year for a long period of 30 to 40 years. Such a program would contribute significantly to a further equalization of educational opportunity, since those whose post-education incomes were highest would help pay for the costs of education of those whose post-education incomes were lower. The prospect of repayment would be a lesser deterrent under a contingent loan program than under a conventional fixed-contract program, and this would lead to a wider use of loans.

It is recommended:

> That a Federal contingent loan program be created for which all students, regardless of need, would be eligible. Undergraduates could borrow up to $2,500 per year, and graduates up to $3,500 per year, for educational purposes. The program should be self-sustaining except for administrative costs, and should be administered through the institutions of higher education, who should determine that a student's total Federal aid (loans, grants, work-study payments) would not exceed annually his costs of education, including subsistence costs, as recognized by the institution in which he is enrolled.

This program should be viewed as experimental. It is difficult to predict the possible extent of its use. But initial funding should be sufficient to prevent having to set priorities among applicants. Although it should be self-supporting, the program might well require heavier Federal support in the initial years for administrative costs and contingencies, perhaps in the amount of 5 percent of new loans annually.

Part-time students. Although the programs recommended above are generally stated in terms of full-time students, they should be adapted in most instances to provide proportional aid for part-time students. Such students are likely to be more numerous in the future, since low-income students may have to work part-time and since there are growing requirements for retraining during a person's working life.

Cost-of-Education Supplements to Institutions

The aid programs intended to help more students enter higher education will add to the present financial problems of most institutions. The full costs of education are not usually met through tuition payments. And many of the disadvantaged students will need special educational assistance such as tutoring and counseling, activities which add to per-student costs. At the doctoral level, the gap between tuition levels and full instructional costs is even greater, and some Federal programs already exist to provide cost-of-education supplements to institutions attended by graduate fellowship holders. The Commission believes this concept should be expanded to the undergraduate aid program as well.

It is recommended:

> That the Federal Government grant cost-of-education supplements to colleges and universities based on the numbers and levels of students holding federal grants enrolled in the institutions, as follows:

Student level, 1970–71 rising to 1976–77

Student level	1970-71	1976-77
Lower division	$525	$750
Upper division	700	1,000
First-level graduate	1,050	1,500
Doctoral	3,500	5,000

The Commission urges that a portion of the cost-of-education supplement be used by the institution to undertake programs of tutoring, counseling and remedial training for those students who are educationally disadvantaged because of socioeconomic factors.

Aside from this special case, the supplements could be used by the institutions at their own discretion to meet general operating costs. Thus they would provide some useful body of experience with general Federal support of institutions, which could be used as a basis for consideration of the many proposals now being made for such institutional grants.

The Commission expects that many students with grants would be drawn into the smaller colleges, where they would receive more individual attention. Many of these colleges would have the capacity for more students if they were given financial support to help offset their added costs. They would also welcome the opportunity to diversify their student bodies.

MEDICAL EDUCATION

Medical and health services education is the one major subject area that we have singled out for specific Federal aid proposals. The reasons are several: the great national needs in the health field and the growing public concern with these needs, the high costs of medical training facilities, the fact that new facilities are needed to serve geographic regions crossing state boundaries, and the high mobility of medical school graduates, many of whom do not remain to practice within the States that provided their instruction.

It is estimated that facilities to provide spaces for about 75 percent more medical students will be required by 1976 over 1966. In contrast to enrollments elsewhere in higher education, the supply of medical school graduates has grown relatively slowly since the 1920's, and it is obvious that more vigorous efforts must be made to increase the number. But costs for medical schools far outstrip the levels in other schools of professional education, and State and private resources cannot finance the needed expansion without major assistance.

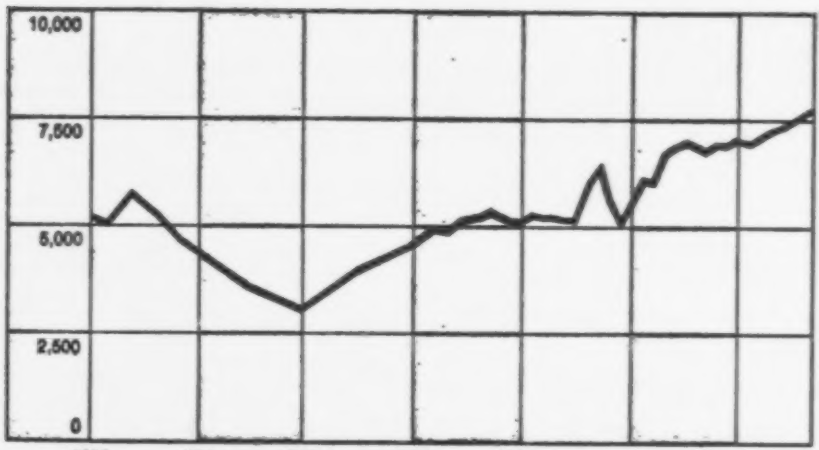


FIGURE 4

Medical school graduates: United States, 1899–1900 to 1966–67

The increased use of medical support personnel may eventually lead to reduced costs of both medical education and medical care, but this possibility does not promise full or immediate solution to the financing problems of medical education.

It is recommended:

That a substantial program of Federal aid for medical and health services education be established to (1) stimulate expansion of existing capacity, (2) plan additional medical schools for geographical areas not now adequately served, (3) expand facilities and develop new programs for the training of medical care support personnel, and (4) increase availability of health services in the community of the medical school and the quality of health care delivery.

Student aid. Medical students should be provided grants on the basis of need in amounts up to $3,500 per year for four years, with free choice of institution. They would also, of course, have access to the loan program.

Institutional payments. Each institution would receive the sum of (1) its enrollment of students working toward the M.D. multiplied by $4,000; and (2) that portion of the enrollment working toward the M.D. in excess of the fall 1966 enrollment multiplied by $2,000; and (3) the total number of residents and interns multiplied by $2,500, provided that no individual student should be counted for more than four years and that the resident and intern program is conducted either at the institution's own or affiliated hospital. Institutional payments could be used for any programs of medical instruction.

Construction funds. Construction funds should be made available for 100 percent of the cost of creating new places, with additional amounts for renovation and replacement.

Start-up grants. Start-up grants should be made available for non-construction costs for approximately 20 new medical schools at the rate of four per year for five years, not to exceed $10 million per school, in areas of geographical and population need and with a university of appropriate quality.

Community health service programs. Federal support should be given for development by medical schools of programs to improve the availability and effectiveness of community health services.

Training of medical support personnel. Federal aid should be given for programs designed to increase the number of support personnel who could be trained comparatively quickly and inexpensively and who could assume under proper medical supervision, some of the duties now performed by M.D.s.

Medical education today is undergoing a searching and constructive self-examination and exhibiting an openness to new concepts and new horizons of service. Medical schools are becoming increasingly important to the quality of urban life, and the Nation will greatly benefit from Federal investment in their expansion.

CONSTRUCTION

The great surge in college enrollment during the last two decades created a growing deficiency in facilities. Federal aid through the Higher Education Facilities Act of 1963 came too late and at too low a level to close the gap, and a deficiency of 20 percent now exists. To keep pace with the continuing increase in enrollments while holding the deficiency at 20 percent will require about $2 billion annually for college and university construction.

During the last academic year 72 new colleges were established. Junior colleges have greatly increased the accessibility of higher education to American youth, and it is estimated that 500 more community colleges should be established by 1976. In addition, 50 urban four-year colleges should be created during this same period to help serve inner-city youth. Funds should also be granted for renovation, an approach which might provide additional facilities quickly and at lower costs.

Support for construction is a highly desirable mechanism for channeling Federal aid to institutions since it carries very limited opportunities for control of educational policy, it increases the Nation's real assets, and, with matching requirements, it stimulates rather than replaces other sources of financial support for higher education.

It is recommended:

> That Federal grants for academic construction be increased from the present provision (two-fifths of construction costs for junior colleges and one-third for other institutions) to one-half of the total amounts required by all institutions for construction, renovation, and replacement of facilities. In addition, start-up grants should be provided for planning and non-construction costs for new junior college and urban institutions, not to exceed $10 million per institution but averaging more nearly $1 million per institution. Funding levels for the academic facilities construction loan program should be increased to provide sufficient loan funds for an additional 25 percent of needed new construction costs.

It should be noted that institutions could thus finance up to 75 percent of new construction through a combination of Federal grants and loans.

It is assumed that some of the estimated 20 percent deficiency could be offset by improvements in the intensity of space utilization.

Funding levels could taper off somewhat after 1975 in anticipation of the slowing down of enrollment growth.

RESEARCH

One of the most essential functions of higher education is its contribution to the advance of knowledge in the Nation. The Federal Government has accordingly provided major support for university-based research. Today approximately three-quarters of all university research is federally financed and, in some highly research-oriented universities, the figure is almost 90 percent. During the period from 1956 to 1962, Federal support of academic research increased at a rate of about 25 percent per year, but the rate of increase slowed sharply after 1962, and last year's increase was only 2 percent.

The Commission believes university research, and thus Federal support for research, must increase substantially over the next few years for several reasons: enrollment of doctoral candidates will continue to rise sharply, at an average rate of 6.6 percent annually through 1975; costs of research, like costs of instruction, are rising more rapidly than the costs of the general economy; the new technology, which makes considerable expansion possible in the scope and quality of research, is also adding to its costs; and critical social problems demand greater research efforts in many areas, including particularly the social sciences.

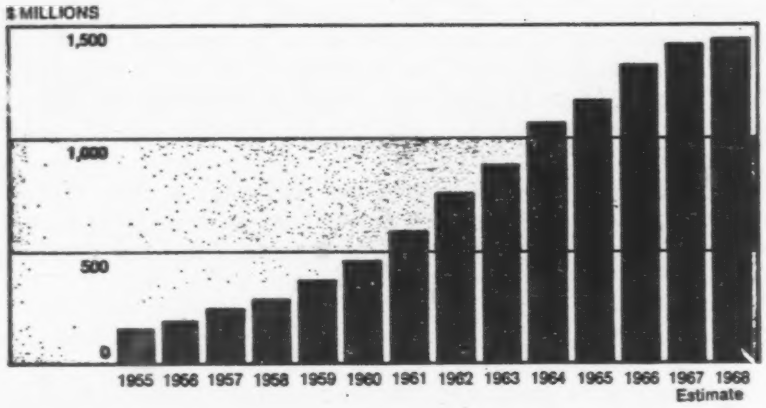


FIGURE 5
Federal obligations for research and development by universities and colleges, fiscal years 1955–1968

It is recommended:

> That the level of Federal funding for university and college research be increased over the next several years but with the annual rate of increase declining from 15 percent in 1970–71 to 10 percent in 1976–77. A grant amounting to 10 percent of the total research grants received annually by each institution should be made to that institution to be used at its discretion, and this amount is reflected within the percentages proposed above.

The present federal system for awarding research grants through multiple agencies based on review and determination of merit of each proposal works relatively well and should be continued. One drawback—the difficulty in obtaining funds for small projects, planning projects, and younger faculty members—would be remedied by the provision above for a 10 percent fund which institutions might allocate for such purposes.

SPECIAL PROGRAMS

The Federal Government has been both sensitive and responsive to areas of particular need in higher education and has established a number of special programs to provide aid for these areas. The Commission has not given consideration to all of these programs but has singled out several for attention.

It is recommended:

> That Federal funding be increased for special programs in the areas of aid to developing institutions, library support, and international studies.

Aid to developing institutions. Many of the Nation's existing colleges have failed to reach their full capability because of limitations of resources. At a time when expanded educational opportunity is urgently needed, these institutions must become full participants in the academic community. The Office of Education now assists such colleges through its developing institutions program, but funds are often sufficient only to tide the colleges over from year to year rather than to encourage significant development. A substantial increase in funding is needed to accomplish this purpose.

Library support. A basic tool of any college or university is its library. The current explosion of knowledge has sharply increased library costs, and present levels of federal support for college and research libraries should be increased, with high priorities for federal grants going to libraries which serve a regional need.

International studies. The number of new nations that have emerged since World War II and the complex problems of their economic and political development and roles in the international sphere have accentuated the need for stronger university-based programs of international studies. The International Education Act of 1966 authorized some grant programs but no funds have been appropriated. Authorized funding should be appropriated, and funding levels increased by 1976.

NATIONAL FOUNDATION FOR THE DEVELOPMENT OF HIGHER EDUCATION

Research and graduate instruction have gained greatly in strength in recent years, in large part because of substantial Federal support of research. Parallel gains have not been made in other areas such as undergraduate curriculum development, instruction techniques, and new programs. The rising costs of higher education make such developments highly desirable, but today's financial pressures often mean that institutions do not have a margin of funds for such undertakings. Federal assistance in this area would play an extremely valuable role.

It is recommended:

> That the Federal Government establish a National Foundation for the Development of Higher Education whose functions would be to encourage, advise, review, and provide financial support for institutional programs designed to give new directions to curricula, to strengthen essential areas that have fallen behind or never been adequately developed because of inadequate funding, and to develop programs for improvement of educational processes and techniques.

The Foundation would be a governmental agency directed by a board and organized along the lines of the National Science Foundation. It would provide initial and developmental funding only; programs that proved successful would be transferred to other permanent government agencies, usually the Office of Education. Examples of possible developmental programs are the following.

Improvement of undergraduate education. Criticism of the quality of undergraduate education has become widespread. A healthy mood of reform is evident on many campuses and could be encouraged through Foundation grants.

Services to elementary and secondary education. The quality of primary and secondary education obviously has a most important bearing on the number and quality of students who enter higher education. The Federal Government has already given support to some college-sponsored programs providing training and assistance to teachers. The Foundation could stimulate further programs in supplementary training, help with curriculum design, consultation in connection with school problems such as integration, and other similar services.

Regional liberal arts centers. Many undergraduate liberal arts colleges have formed consortia to permit them to use more effectively the resources available to each institution, and the Foundation could encourage this promising trend.

The new technology. The newly created program of Networks for Knowledge and on-going programs providing financial assistance for computer use at universities and colleges should be continued. The Foundation might be particularly helpful in evaluating proposals for programs designed to determine the educational effectiveness of many tools of modern technology.

Urban-grant activities. If universities and colleges are to aid in the solutions of complex urban problems, they will have to develop new curricular programs and new concepts of public service in the inner cities. The Foundation might fund such developmental programs in their early stages.

SUMMARY OF FUNDING NEEDS FOR FEDERAL AID RECOMMENDATIONS

Following is an itemized estimate of funding requirements for the federal aid recommendations made by the Commission, for the years 1970–71 and 1976–77.

ESTIMATED FEDERAL EXPENDITURES
FOR COMMISSION PROPOSALS, 1970–71 AND 1976–77
($ BILLIONS)

	1970–71	1976–77
STUDENT AID PROGRAMS	1.91	3.56
Educational opportunity grants	1.10	2.14
[Basic student grants]	[0.90]	[1.60]
[Supplementary matching grants]	[0.11]	[0.38]
[Institutional scholarship funds]	[0.09]	[0.16]
Work-study program	0.51	0.87
Counseling program	0.03	0.04
Graduate talent search	0.03	0.10
Doctoral fellowships	0.11	0.16
Loan program	0.13	0.25
COST-OF-EDUCATION SUPPLEMENTS	1.13	2.71
MEDICAL EDUCATION PROGRAM	0.33	0.43
Student aid	0.03	0.04
General support grants	0.23	0.35
Construction	0.07	0.04
CONSTRUCTION	1.26	1.22
RESEARCH	2.00	4.05
FOUNDATION FOR THE DEVELOPMENT OF HIGHER EDUCATION	0.10	0.20
SPECIAL PROGRAMS	0.30	0.80
TOTAL	7.03	12.97

ESTIMATED FEDERAL LOAN COMMITMENTS
UNDER COMMISSION PROPOSALS, 1970–71 AND 1976–77

	1970–71	1976–77
CONSTRUCTION	0.53	0.61
STUDENT LOANS	2.50	5.00

As this summary indicates, the total cost of the various Federal aid programs would be about $7 billion in 1970–71 and would rise to almost $13 billion in 1976–77. The current cost of comparable Federal aid programs is about $3.5 billion. The Federal share of the funding of higher education institutions would rise from 21 to 32 percent, and the State share would fall from 27 to 17 percent (see Figure 3 in an earlier section of this paper). The private share would remain at approximately 50 percent.

Some shifts in funding patterns would occur. Research support and construction aid would represent a somewhat smaller proportion of the total aid package, while student aid and cost-of-education assistance to institutions would increase in importance. Research and development support, however, would continue to constitute the largest single aid category.

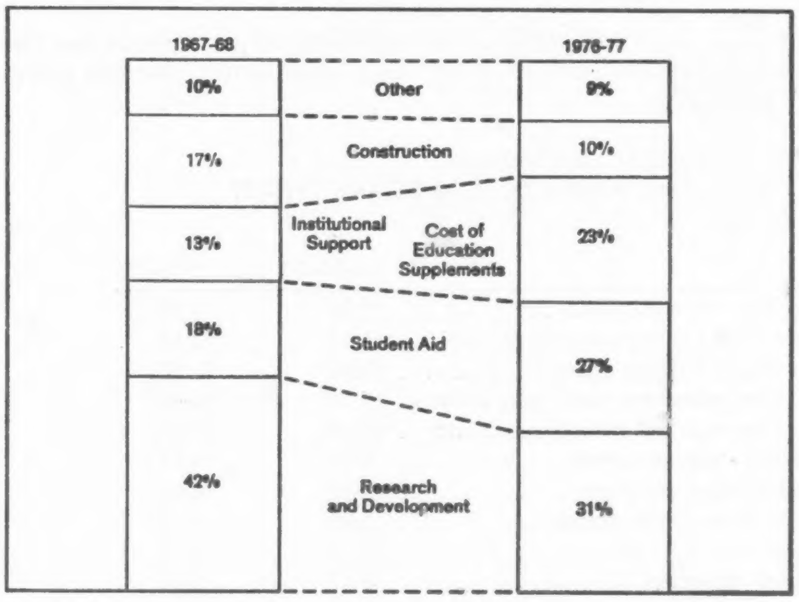


FIGURE 6

Percentage of federal aid to higher education by purpose, 1967–68 and 1976–77

	1967–68 ($ BILLIONS)	1976–77 ($ BILLIONS)
Research and development	1.45	4.05
Student aid	0.62	3.60
Institutional support cost of education supplements	0.44	3.06
Construction	0.57	1.26
Other	0.37	1.25
Total	3.45	13.22

Note: The total of $13.22 billion for 1976–77 includes federal expenditures for Commission proposals and an estimated $250 million for certain programs of federal support to higher education institutions not covered in Commission proposals but expected to be continued. The 1967–68 institutional support figure includes an estimated amount for fellowship and traineeship program expenditures through institutions of higher education which are retained by institutions to defray partially the costs of the training programs.

Even with the levels of Federal support proposed here, State and private sources will find the financial burden of basic support of higher education extremely heavy over the decade ahead. Institutions of higher education for their part will find it absolutely essential to make the most efficient and economical use of their available resources, to exercise the utmost restraint and care in the provision of new programs and facilities, and to reexamine their budgetary standards and practices. The Commission believes quality can be maintained during a difficult fiscal period by scrupulous evaluation of all current and proposed educational programs.

Tuitions and Student Loans in the Finance of Higher Education

Howard R. Bowen[*]

INTRODUCTION

Since World War II a veritable revolution in the finance of higher education has occurred. Before that time, students were financed primarily by their families with modest amounts of scholarship help and virtually no loans except to tide over temporary emergencies. State institutions were financed primarily by State governments and tuitions were miniscule. Private institutions were financed by a combination of private gifts, endowment income (resulting from past gifts), and tuitions. These institutions received virtually no public funds. The Federal Government's role was negligible except for certain agricultural and other specialized programs.

Following World War II, and especially since 1955, vast changes have taken place. Scholarships and other grants to students have been expanded to many times their previous amounts; more recently, the use of loans to students has expanded sharply. In the administration of student aid, increasing emphasis has been placed on the financial need of students, and institutions have raised tuitions almost routinely year after year. With the increasing number of married students, spouses have become a major source of support for students. During this period, the Federal government has become a major source of funds for financing students through both grants and loans, and it has become an equally important contributor to institutions through a wide array of grants, awards, contracts, and loans for buildings, research, training programs, and other specified purposes.

Meanwhile, philanthropic foundations have grown in number and resources; profit-making corporations have become patrons of education; and colleges and universities have become more professional and more aggressive in fund-raising. State governments have offered scholarships to students and have in some cases contributed directly to private institutions. All of these changes have added up to a remarkable transformation of the system of higher educational finance.

But the transformation has not been completed, and today there are many proposals for change and much energetic activity among educators, public officials, and economists looking toward solution of what is often called the financial "crisis" of higher education. From these many proposals, however, one can identify two policy questions of transcendent importance. The first of these is: What fraction of total educational cost should be borne by the families of students and what proportion by "society" through taxes and gifts? This issue is often discussed in terms of the level of tuitions, but it is broader than that, as I shall show. The second question is: Should students whose parents cannot meet all their educational costs be financed primarily by means of loans or grants? The remainder of this paper will be devoted to a discussion of these two issues.

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Most of the debate centers around two policy positions. The first is that students and their families should bear most of the costs of higher education. To give effect to this principle, it is proposed that students and their families should contribute whatever they can afford and that the deficit for students of low-income families should be made up primarily by long-term loans. The second position is that "society" should bear a substantial share of the educational cost for all income classes, that students of low-income families should be financed primarily by grants, and that loans should be used sparingly as a supplemental form of aid. I shall argue that the second of these positions is the sounder one.

As a first step in the analysis, I shall identify the costs of higher education which must be financed.

1. THE COSTS OF HIGHER EDUCATION

By the *costs of higher education* in any year, I mean the value of all the resources devoted in that year to the education of students in post-secondary schools, colleges and universities.

Within this definition, the costs of higher education may be divided into three parts: (1) the time of the students being educated; (2) incidental expenses of students for books, supplies, transportation, etc.; and (3) costs of operating institutions of higher education.

By far the largest of the three costs is the *time* of the students. If persons of the age of 18 to 25 or older were not in college, most of them would be employed in remunerative and socially productive occupations. By attending college, they are foregoing substantial income and society is sacrificing vast productive power. It is true that by going to college most students will increase their potential future income; nevertheless, for each year they are in college they (and society) are sacrificing on the average perhaps $4,000 of income.[1] When it is considered that about 5,000,000 young men and women are now attending college full-time and that about 2,000,000 others are attending part-time, the magnitude of the cost in foregone income can be appreciated.

Most students, if they were not in college, would be earning their own living. Because they are in college, someone else—parents, other donors, government, private lenders—must provide all or part of their living expenses. This someone else is really replacing part of what the student might have earned. By working part-time, the student can also replace some of the foregone income himself. Any remaining balance of foregone income is an unrecovered loss which the student bears. Thus, the foregone income consists of three parts: (1) the unrecovered loss; (2) the portion replaced through part-time earnings of the students; and (3) the portion replaced through contributions or loans of others for living expenses. Whoever pays this third portion—whether parents or donors or taxpayers—is in a sense paying the student for his time.

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[1] The present average weekly earnings in non-agricultural private employment is about $103 or more than $5,000 a year. Considering that persons of college age are young and inexperienced, their earnings might be less than this average. However, these people are the very cream of American youth as to energy, intelligence, and ability and so their earnings would probably be greater than those of presently employed young people. I would guess that $4,600 a year is a reasonably conservative estimate of their potential average earnings. Some, especially women, would not be in the labor force if they were not in college, and some would be unemployed. I would guess that perhaps seven-eighths of them would be employed if they were not in college. Assuming that earnings would be $4,600 for those employed and that 87.5% would be employed, the average foregone income of each college student would be about $4,000.

The second major element of cost is *incidental expense*, relating to college attendance, over and above what would otherwise have been needed. Such expenses includes books, supplies, equipment, transportation, club memberships, and extra or special outlays for living expenses. (Note that one would not count in these costs living expenses that the student would have incurred even if he had not been in college). Incidental expenses vary greatly among students in different courses and institutions. I would guess that the over-all average per student would be around $400 a year.

A third element is the *cost of operating the colleges and universities*. Because institutions engage in many research and public service activities not directly related to instruction, one may distinguish between educational and other costs. I shall divide institutional costs into three classes: (1) educational costs financed from tuitions and student fees, (2) educational costs financed from other sources, and (3) costs for research and public service.

Using the above classification of costs, it is possible to estimate roughly the dollar amount of each cost element as of 1968–69:

	Average per student	Total all students [1] (billions)	Percentage
1 Foregone income of students:			
(a) Unrecovered loss (borne by students)	$2,000	$11.0	29.6
(b) Portion replaced through students' part-time earnings (borne by students)	800	4.4	11.8
(c) Portion replaced by parents and others through gifts, grants, and loans	1,200	6.6	17.7
(d) Subtotal	4,000	22.0	59.1
2. Incidental expenses of students	400	2.2	5.9
3. Operating costs of institutions: [2]			
(a) Educational costs financed from tuitions and student fees	583	3.5	9.4
(b) Educational costs financed from other sources	833	5.0	13.4
(c) Costs for research and public service	750	4.5	12.1
(d) Subtotal	2,166	13.0	34.9
4. Grand total	6,566	37.2	100.0

[1] Assumes 5,000,000 full-time students, 2,000,000 part-time students, and 6,000,000 full-time equivalents. Estimates of foregone income and incidental expenses assume that the 2,000,000 part-time students are equal to 500,000 full-time equivalents.

[2] To distinguish between educational costs and costs for research and public service is treacherous because instruction and research are closely related joint products. Research is useful to teaching not only because it contributes a helpful intellectual atmosphere but also because, even in a college wholly dedicated to teaching, research is necessary to keep the faculty alive intellectually and to induce them to stay with the institution.

It should be emphasized that these statistics are rough estimates. These figures are intended to show general orders of magnitude rather than precise amounts. Several broad conclusions emerge nevertheless.

First, the principal costs of higher education are those associated with the student, namely, freeing the student from employment so that he can attend college and providing him with the necessary funds for incidental expenses. These two elements of cost make up about two-thirds of the total. Institutional costs amount to only one-third. When tuitions are added to the other costs associated with students, the percentage on account of students rises to three-fourths of the total.

Second, despite all the financial apparatus that has been devised in recent years, students and their parents bear the principal burden of higher educational costs.

Third, tuitions at present levels represent a tiny fraction of the total cost—less than ten percent. A moderate expansion or contraction of tuitions would not change the total system decisively.

Fourth, the major items of cost are the replacement of earnings and the provision of incidental expenses of students—not the finance of institutions. If there is to be an opening of opportunity through higher education to young people of low and middle income families, the major task will be the finance of students, not the finance of institutions. This does not means that institutions do not need help. They do. Nevertheless, the bigger part of the job is to get the students to college, and the smaller part is to finance the institution—formidable as that smaller part may be.

Fifth, since the bulk of higher educational costs consists of student *time*, in the conduct of colleges and universities the important place to economize is on the time of students rather than on the outlays of institutions. Yet higher education is often conducted as though the time spent by students were a free good and the only useful or necessary economies were those relating to institutional operations. I do not necessarily imply that efficiency in the use of student time requires that education be speeded up, though that is one possible route to greater efficiency. Rather, I suggest that institutional efforts should be adequate in quality and effectiveness to justify the high cost of the student time involved. I daresay if colleges had to pay wages at going rates for the time of the students involved, there would be a tremendous revolution in instructional methods and in the deployment of institutional resources.

2. NOTES ON THE HISTORY OF HIGHER EDUCATIONAL FINANCE

Throughout most of American history, the finance of the students' living costs and incidental expenses was a responsibility of families including parents, relatives, and students themselves through part-time earnings. Scholarships and loans were not an important element. The finance of institutions, on the other hand, was largely a responsibility of "society" as represented by churches, private donors, and state government. Tuitions were almost non-existent in State institutions and represented only a fraction of institutional cost in private ones. A sharp distinction was made between the finance of students which was largely the responsibility of families and the finance of institutions which was the responsibility of "society." In this traditional system, education was fairly easy to come by for those young people whose families could manage to support them wholly or in large part. These families were, however, generally those in upper-income groups and those (such as families headed by clergymen and teachers) who were poor but highly motivated and willing to make a great sacrifice.

In this system, higher education was largely the preserve of privileged young people—privileged in income or privileged in family appreciation of education. The encouragement of "society" came through free or low tuition and not usually through scholarships or loans. As the tuitions of private institutions rose, opportunity was kept open through the low-tuition public institutions. For example, when I attended a state college in the 1920's, tuition was only $10 per year—but scholarships and loans were few and these were usually based on scholastic performance and not on financial need. The problem of college-going then was primarily to present oneself to the institution with adequate living and incidental expenses, not to help support the institution. This system persisted until World War II.

The first great change came with the G.I. Bill which provided massive *public* funds for the finance of students. The returning veterans were considered no longer dependent on their parents, and it was felt that they deserved the opportunity for higher education, so grants were provided to cover living costs, incidental expenses and tuitions. The spectacular success of the G.I. Bill in bringing higher education to a generation of young men and women undoubtedly changed American attitudes about higher educational finance. Thereafter, in the 1950's grants to students based on financial need—mostly financed by institutions—became widespread, and beginnings were made in expanding the use of loans. Some of the new credit schemes were available to parents and some to students.

In the 1960's, the Federal Government greatly expanded its role in the finance of students by providing various types of grants and loans in substantial amounts. At this time, long-term loans to students became a firmly established part of the financial system. However, loans were usually used in conjunction with parental contributions, work, and grants, and the total indebtedness of any one student was usually held down to one or two thousand dollars. Up to the present, loans have been considered a supplemental, rather than primary, source of student finance.

In the post-war period, tuitions were pushed up steadily and substantially in both private and public institutions. But the prevailing opinion continued to favor low tuitions, and the raising of tuitions was considered an unfortunate necessity. But in recent years this opinion has been changing in some circles and it is frequently proposed that tuitions should be raised boldly so that institutional funds would be derived primarily from tuitions. Funds with which low-income students could meet their costs would then be provided by grants or long-term loans according to financial need.

A persistent element in this history has been the concept that the *family* is responsible for the support of children through college and for the payment of incidental expenses and tuitions. But even this concept is now changing. The first major breach was the G.I. Bill under which veterans were considered to be emancipated from their families.

A second modification of the old concept of family responsibility resulted from the prevalence after World War II of early marriages. The spouse was often substituted for the parents as a source of support. A third modification came about through the recent expansion in advanced study. A distinction appears to have been accepted between the single undergraduate who is usually considered dependent on his parents and the advanced graduate or professional student who is considered emancipated from his family. Hence, undergraduate aid is usually based on need as measured by parental ability, and graduate aid is often unrelated to family circumstances. Also the attitude has been changing as to the amount of sacrifice a family is expected to make, and aid has become available to families in fairly high income brackets.

Still another change in the family concept has been that some men and women of college age, eager to be considered independent adults and chafing under parental authority based on parental financial support, have sought to escape from dependence on parents. Finally, the newer forms of loans have been loans to *students*, to be repaid by students out of future earnings, rather than loans to parents. The effect of these loans has been to relieve parents of traditional responsibility and to shift it to their children. But despite all these changes, that have tended to relieve parents of financial responsibility, it is still generally accepted in America that parents are responsible according to their means, for the finance of their children at least through the undergraduate years. Parents are still the bulwark of higher educational finance.

In earlier days, it was considered adequate if a family met the living costs and other expenses of a son or daughter, plus perhaps a small contribution to institutional cost in the form of tuition. It was expected that "society" as represented by donors and taxpayers would meet the bulk of the institutional costs. More recently, however, it has often been suggested that parents should pay as much as they can afford and that well-to-do families should not escape with less than full cost. The presence on campuses of sports cars and other marks of luxury are often cited as evidence that tuitions should be raised.

Wide agreement seems to have been reached on several propositions concerning the role of the family in the finance of higher education. First, there seems to be no debate on the presumption that the student himself should bear the full cost of any unrecovered loss of income due to his devoting time to higher education. Second, the student should contribute as much as possible through part-time work, though this work should not interfere unduly with his studies and other valuable activities of college life. Third, the family should contribute according to its ability toward the undergraduate student's living costs and incidental expenses. The family is on the whole a reliable and willing source because most parents desperately want their children to go to college and are prepared to make sacrifices to this end. Fourth, some form of aid should be available, either grants or long-term loans to students, to cover living expenses and college costs beyond the family's capacity. Finally, instructional costs should be distinguished from expenses for research and public service not closely related to instruction, and the latter should not be charged to families by means of tuitions but rather should be financed by taxes and private gifts. Agreement on these propositions does not necessarily justify them in principle, but it makes them workable in practice.

But beyond these areas of general agreement, there are differences of opinion on two major issues: (1) the proportion of the educational costs of colleges and universities to be met from taxes and private gifts and the proportion from tuitions; and (2) when families are not financially able to provide all educational costs for their children, the relative role of loans and grants in making up the deficits.

3. THE FINANCE OF INSTITUTIONAL COSTS OF INSTRUCTION: THE ROLE OF TUITIONS

Traditionally in America, low tuitions have been advocated "to keep open the doors of opportunity to aspiring young men and women." The raising of tuitions has almost always been done reluctantly and only when other sources have proved inadequate. The present position of tuition in the finance of higher education is largely the result of expediency not of principle. In recent years, however, attitudes have been changing, and high tuitions, even high enough to cover all instructional costs, are often advocated on principle.

Three major arguments are often advanced in favor of high tuitions.

The first argument is an application of the "benefit theory," namely, that the cost of public services which benefit particular individuals should be borne by the beneficiaries. It is argued that the benefits from higher education accrue primarily to students (or to parents who value the economic and cultural advancement of their children), and that the institutional costs should be paid primarily or wholly through tuitions. Taxpayers and donors, it is said, should not be expected to contribute—especially since many college students and their parents are or will be in the upper-income class.

Even if one accepts the benefit theory, it scarcely justifies the raising of tuitions. Those who use this argument usually focus on instiitutional costs of higher education and overlook the much larger costs associated with students—loss of income, living expenses, and incidental expenses. When all costs are considered, the portion borne by families is substantial. They are already paying dearly for the individual benefits received. Moreover, society at large benefits from higher education through broad economic, social, and cultural advancement and society (taxpayers and donors) might reasonably bear some of the cost even on the benefit theory.[2] More important, high tuitions, unless students are much more generously financed through grants than they have ever been or are likely to be in the near future, are a significant barrier to college-going on the part of young persons from low-income families. It would seem extraordinarily perverse in the America of today to raise the barriers to higher education precisely at the time when we are, or should be, trying to open up opportunity to young persons of low income and minority backgrounds. Finally, the benefit theory would be more plausible as a justification of higher tuitions if the benefits of college-going were the preserve of a small minority. On the contrary, America is heading toward very broad participation in higher education. In areas where ample and varied facilities have been provided, as in California, as many as 80 percent of all young people attend colleges or universities. With this broad base of participation almost everybody benefits to some extent. I would conclude that the benefit theory is a weak basis for raising tuitions.

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[2] The argument that "society" benefits and therefore should bear some of the cost is opposed by some economists. They point out that society benefits from many private expenditures and that we do not regularly "subsidize" such expenditures merely because of the social benefits. For example, society benefits from good nutrition which tends to prevent disease, but society does not, therefore, arrange for food to be sold at prices below cost. As opposed to this view, I would point out that education is so critical to the advancement of the society that encouragement of it through subsidization from general taxes is fully justified. Certainly if a case can be made for "free" elementary and secondary education, where the element of cost resulting from foregone income is largely absent, a much stronger case can be made for subsidizing higher education where the element of foregone income is so large.

The second argument for high tuitions is an application of the "ability theory", namely, that families who can afford to pay the cost of educating their children should bear the full cost. To accomplish this objective, tuitions should be raised to cover the full cost of instruction. Otherwise the children of the rich would be "subsidized" by general taxpayers and donors who support institutions of higher education. Families of lower income would pay the same tuitions but would be assisted by loans or grants. This argument could be applied just as well to public services other than higher education, e.g., public elementary education, police protection, public library use, etc. These services could also be financed by charges to cover full cost, with grants or loans to help low-income persons. They are not because, when society wishes to encourage the use of a public service by making it readily available to all, everyone—rich and poor alike—should enjoy the service on the same terms. However, assuming that "society" is not satisfied with the prevalent distribution of income, the general tax system which finances such a service should impose graduated rates of a type that would require the rich to pay more than the poor. It is not wrong for the rich to receive higher education at a charge below full cost any more than it is wrong for them to receive any other public service or private good on the same terms as the rest of the population—provided the general tax system is "equitable." If one argues that the rich are not paying their share of higher educational costs, the remedy is not necessarily to raise the charge to the level of full cost but to revise the tax system. One must admit, however, that charging higher charges for the services of higher educational institutions, is one way of altering the distribution of income. But it is not clear why higher education should be singled out from among other social services for differential pricing. On the whole, the ability theory is not a conclusive justification for high tuitions.

The third argument for raising tuitions is what I would call the expediency argument. Whenever institutions cannot find adequate funds from any other source, they turn to tuitions as a last resort. Since tuitions still represent only a small fraction of the total cost of higher education and since the demand for higher education is insistent, tuitions can be raised substantially without much effect on enrollments. For the Nation as a whole, tuitions represent less than one-tenth of the total cost of education. If they were doubled, they would amount to only one-fifth of the total. So institutions which still have relatively low tuitions are under considerable temptation to raise them.

The expediency argument is the one that usually prevails over the more subtle ability and benefit theories. But expediency is not a very compelling basis for a policy. In conclusion, I find no persuasive argument for tuitions as a method of financing institutions, and I conclude that the Nation would be well advised to eliminate or reduce tuitions, or at least to avoid raising them further.

If financial need does not permit all tuitions to be eliminated or reduced, charges in some parts of the system, e.g., community colleges and State universities should be held to a minimum so that higher education may be readily accessible to persons of low income and minority background. There must be a point of entry and a track through the system that presents a minimum of financial barriers. And of course a condition of low tuitions is adequate institutional support through appropriations and gifts.

4. THE FINANCE OF STUDENTS: THE ROLE OF LOANS

If there were a system of generous grants to students, with the amount of the grants proportioned to financial need, then high tuitions would not represent a serious barrier to educational opportunity, though the red tape involved in securing grants might still present an obstacle to low-income and minority-group students. With such a system of grants, opportunity for young people would not be seriously curtailed. However, it is often proposed that *loans* rather than grants be used to finance students. Specifically, it is proposed that long-term loans payable by the student over many years or over his entire lifetime be the principal form of support of students whose families cannot foot the entire educational bill. In my judgment, the case against heavy reliance on loans is compelling.

First, heavy reliance on loans would clearly present a serious obstacle to low-income students. No matter how readily available the loans or how generous the terms, to ask young persons from low-income and minority backgrounds to assume indebtedness of $5,000, $10,000, or $20,000 to get through a program of higher education presents a formidable barrier. The plan might not frighten away middle-income people, but it would surely deter low-income students. To offer loans as the principal means of financing students, at the very instant when America is trying to open up opportunity to millions of low-income young people, would seem to be singularly untimely. As a serious proposal to be presented to minority groups, it is even wanting in elemental tact. It is saying to a young black person, for example, "The opportunity for higher education is wide open. All you have to do is borrow $5,000 or $10,000, whereas your white friends will be supported by their parents."

Second, the plan is highly inequitable as between high-income and low-income students. The student from a high-income family ends up his college career with little or no debt, while the student from the low-income family might have $5,000 to $20,000 of debt depending on the length and nature of his program. The low-income student who is saddled with the debt, is the very one likely to have the least advantage in a career and therefore to start out in life with a double handicap. If one clings to the theory that parents are responsible for the education of their children, then society should step in as surrogate for the children of low-income families whose natural parents cannot assume this responsibility. If colleges and universities are to be financed by high tuitions, the finance of needy students should be based largely (not necessarily wholly) on grants.[3]

Third, from the social point of view, the use of loans does not achieve one of its avowed objectives, namely, to place the cost of higher education upon the students. The true economic costs of higher education consist of the use of resources at the time the education occurs. If these costs are financed by loans, the true economic cost is borne *at that* time by the ultimate lenders whether they be private savers or taxpayers. They are the ones who give up the needed resources. Later, when the interest and principal are repaid, no economic resources are used and no social cost is involved. Repayment is then merely a transfer payment from debtors to creditors.[4] The fact is that there is no way to levy the cost of higher education on impecunious students. The costs can only be borne by the donors, the taxpayers, or the lenders who pay the needed resources at the time the education takes place. This being so, it would seem sensible to finance institutions directly by means of gifts and taxes and not go through the red tape of making and collecting loans and putting a large part of the coming generation into debt.

It is true that the loan system might be operated as a kind of revolving fund such that repayments of past loans might be used to finance students then in college. But this system would be of the nature of a special tax on former students to finance present students, the amount of the tax being inversely related to the financial ability of the borrowers at the time they were in college and not related in any way to their present financial ability. I do not find any basis for recommending such a system of finance. The curse of such a system would be lessened if repayments were geared to income as proposed in the Zacharias plan and similar schemes. However, even with this improvement, I do not see any significant advantage of massive loans to students of the kind so often advocated today.

5. FINANCE, POWER, AND ACADEMIC FREEDOM

I have presented the case against a model of higher educational finance which includes the finance of institutions by means of tuitions at the level of cost per student, and the finance of needy students by means of long-term loans. I have indicated that the high-tuition feature would be tolerable if needy students were financed mainly by grants instead of loans, but concluded that a model combining low tuitions with grants to needy students rather than loans would be preferred.

The combination of high tuition with student loans has irresistible appeal to hard-pressed politicians because it would relieve the general taxpayer of all or most of the costs of higher education. This model is also attractive to many educators because it would appear to solve the fund-raising problems of institutions. Their only remaining financial problem would be to attract sufficient enrollments. But with this model the finance of institutions would be wholly dependent on students. Students would correspondingly achieve great power over institutions. Traditionally, educators have been suspicious of any plan that concentrates power in any one group or agency, whether it be a few donors, a single Federal agency, the state government, or students. It has been widely held that institutional independence is necessary to academic freedom and is fostered by diversification of sources of income. It is not clear that students, as a single or principal source of funds, are less likely to repress freedom than any other source of finance. The diversification argument may not be wholly persuasive. There are many examples of donors singly or in groups, or state governments, which have dominated the finances of particular institutions without undermining academic freedom. However, in my judgment, it would be safer for institutions to be financed from a variety of sources, rather than to be utterly dependent on a single source.[5]

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[3] In the final section of this paper is a positive proposal involving both grants and loans.

[4] Economists will recognize a similarity of this argument to the well-known argument about the futility of trying to transfer the costs of war to future generations.

To sum up, the disadvantages of the high-tuition *cum* student-loan model are serious—in my opinion, fatal. This model tends to shut off opportunity; it is inequitable as between students of low-income families and those of affluent families; it concentrates excessive power in one group; and it serves no economic purpose since economic costs must be met in the present anyway.

6. A CONCRETE PROPOSAL

Having argued against the high-tuition *cum* student-loan model of higher educational finance, I am perhaps called upon to present a concrete counter-proposal. This I have done at some length in another paper which I shall briefly summarize here.[6]

My plan was constructed with the objectives of encouraging the institutions of higher education to progress, opening up opportunity for students of all income and ethnic groups, affording reasonable equity in distributing the cost of higher education, and safeguarding the legitimate interests of both private and public institutions. The plan is evolutionary in spirit and builds upon tradition and well-tried practices. It is flexible in that it could easily be adjusted to changing conditions and varying levels of appropriations.

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[5] Various other arguments for the high-tuition-student-loan model are made, among them: (1) institutional diversity would be encouraged because in attracting students each institution would try to offer programs tailored to the need of its clientele, (2) students would be very free in the choice of institutions and programs, (3) students would value their education because people appreciate what they pay for, (4) institutions would be in direct competition for students and would thus be forced to be efficient so as to offer attractive programs at the least possible cost. These arguments may have merit but the advantages claimed could be essentially achieved under [illegible] system of finance based on low tuitions and grants to students supplemented by loans.

It should be mentioned also that the high tuition [illegible] provide for only those institutional costs which are related to instructio[illegible]antial costs involved in research and public service and not closely related [illegible] would still have to be met from sources other than tuitions. The institutio[illegible] not become totally self-supporting through this plan.

[6] *The Finance of Higher Education,* Carnegie C[illegible] Higher Education, 1947 Center Street, Berkeley, Calif., 1968.

The plan is in three parts: (1) Students would be financed partly by grants based on the difference between a minimal college-going-budget and the financial ability of parents and students as determined by a means test. (2) In addition, students would have access to long-term loans, without a means test, to take care of "extras" over and above the minima provided in the grants or the amounts supplied by parents. Both the grants and loans would be provided from Federal funds but would be administered by the colleges and universities. (3) Institutions would receive unrestricted grants by which the Federal government would share in future increases in cost per student and in the cost of future enrollment growth.

The proposed grants to students would be available to any student showing need. There would be no scholastic requirement except that the student be enrolled full-time in an approved college or university of his choice at any level from the freshman year to the end of graduate or professional study. The amount of the individual grant would be set according to need as measured by the cost of a minimal educational program and the ability of the parents to contribute and of the student to earn. The purpose would be to provide a financial base for any student, regardless of circumstances, to attend college as long as his abilities would permit without his ending up heavily in debt.

In setting the amount of the grant, a budget of needed expenditures for the student would be set and the grant calculated by subtracting from the budget the estimated ability of the parents to contribute and the estimated earning power of the student. The College Entrance Examination Board and the American College Testing Program have developed procedures for administering such a program.

Since the proposed grants would provide only a minimal base of support, to be augmented if necessary by loans, the budget for each student would be tight and would be set by fairly standard formulas and not by elaborate tailoring of each budget to special individual circumstances. For example, the budget might have a fixed sum for transportation which would allow for commuter travel by public conveyance or travel to an in-state residential institution. It would have a fixed amount for books and supplies. The amount allowed for board and room in a residential institution would be set at or below the average cost of supplying board and room by institutions in the area. The amount allowed for board and room for commuter students would be based on the average imputed cost of board and room in a family. The allowance for tuition would not be the tuition charged by the institution attended, but rather some fraction of the average instructional cost at all institutions in the area or in the nation. The various components of the student budget could be adjusted from time to time to reflect changing costs of attending college. The point is that the budget would be minimal. It would not enable students to travel from Maine to California to attend college, to live in luxury, or to enroll in high-cost institutions. Its purpose would be to enable any student to get to and through college without heavy indebtedness if he is prudent and willing to make moderate sacrifices.

The grant system described above would, by itself, be fairly restrictive. It would provide only the bare essentials for the low-income student and because of the means test would do nothing for the student from families of middle and upper incomes. Because of its reliance on fairly rigid formulas, designed for simplicity, it might be mildly inequitable in its application to particular cases. This minimal and rigid grant system should be supplemented and reinforced by a national system of student loans to provide flexibility, to meet individual needs and preferences, and to enlarge opportunity. The loan system would carry with it no means test, and hence would be available to persons of all income classes. Loans could be used to finance the extras not available to low-income students from the grants and not available to middle-income students from current family income. Loans could also be used even by upper-income families if they chose to finance education in this way.

The loan system would give students of all income classes flexibility and independence. For example, a low-income student unable to "get by" on his grant could supplement his resources by a small loan; a student whose parents refused to contribute to his education would have a way out; a student wishing to end his dependence upon his parents could emancipate himself; a student who wished to attend an expensive college or an expensive program beyond his immediate means could so choose; a student who wished to enjoy amenities above the bare minima could do so within the limits of his borrowing power; a student wishing to extend his education an additional year could confidently make the decision; etc. These free choices, however, would always entail a sacrifice in the form of eventual repayment of interest and principal and would be restricted by the maximum limits placed on the amount to be borrowed by any student.

The combined grant-loan system would give every young person a chance for as much higher education as he wished and was qualified to receive. The grants would provide this education on a minimal basis without the student's having to go into debt. The loans would give the student freedom and flexibility but at the sacrifice of going into debt.

This grant-loan system would exert no onerous controls over the colleges and universities. They would be free to operate according to the wishes of their constituencies. They could offer whatever programs they chose and could support, and charge whatever fees they wish. Students—armed with parental support, grants, and loans—would have free choice of institutions and programs. Institutions would be free to provide whatever supplemental student aid they wished in the form of scholarships, grants, or loans.

The third part of my plan, unrestricted grants to institutions, would enable the Federal government to help the colleges and universities meet the *additional* costs of future enrollment growth and of the inevitable future increases in cost per student. A major principle, I think, is that the Federal government should not attempt to replace present sources of income to the institutions. It should not relieve the states or donors or students or their parents from present burdens. These burdens are in fact being carried, and the institutions are operating at the most satisfactory level in their histories. To replace existing funds with Federal funds would only slow up the potential progress of higher education. The need is for more money—not the relief of existing sources. Indeed, the system should, if possible encourage existing sources to increase their efforts. Over time, as the national income grows, the states can increase their appropriations, donors can increase their gifts, and students and their parents can increase tuition payments. The Federal program should be designed to share in future increases in costs, to help relieve additional burdens, not to assume more of present burdens.

Under my proposed formula for Federal aid to institutions, the Federal government would pay each institution a fraction (e.g. half) of any increase in cost by reason of enrollment growth and a similar fraction of any addition to cost by reason of generally increasing educational cost per student. The plan would include simple but effective provisions to hold Federal outlays to reasonable levels and to give the Federal government a position of partnership, but not dominance, in the finance of higher education.

The plan I have presented would provide for diversified support of higher education. The sources of support would include students and their parents, state legislatures, private donors, and the Federal government. The share of the Federal government would increase over time. But since its contribution would be divided between support of students and support of institutions, and institutional support would be partly in the form of unrestricted grants, the direct power of the Federal government over institutions would be held in check. Because of foregone earnings and cash outlays, students would still be the major contributors to the economic cost of higher education.

Does Higher Education Need More Money?

Michael Clurman*

INTRODUCTION

Several years ago, President Kennedy was listening to reports from two of his top aides who had just returned from Vietnam. The first aide reported that the situation was going splendidly. The Viet Cong were on the run, President Diem was idealized by his people and the American advisors were turning the South Vietnamese army into a first rate fighting force.

The second aide reported that the whole policy was teetering on the edge of disaster. The army was disintegrating, the Viet Cong were gathering strength and the peasants distrusted their government. After reflecting on this briefing for a few moments the President asked dryly, "Are you sure you two gentlemen have just returned from the same country?"

Observers of the contemporary scene in higher education must surely sympathize with President Kennedy's reaction. On the one hand, we read that higher education is richer both absolutely and relatively than ever before in its history. Faculty salaries have been rising at a faster rate in the last ten years than wages and salaries generally, income from research contracts has increased five-fold over a ten year period, private donations have been at a high level by any historical standard, and mere undergraduates have access to expensive equipment (such as high speed computers) unheard of fifteen years ago. On the other hand, we have been hearing loud laments, even from some of our richest private universities, that they are increasingly hard pressed financially and that unless large additional sources of aid are uncovered in the future, they will be in danger of suffering a severe deterioration in quality if not a total collapse. In order to combat these dangers it has been widely proposed, especially by college administrators, that the Federal government embark on expanded programs of institutional aid.

In this paper I will: (1) show that programs of institutional aid are an inappropriate response to the wave of financial problems which are currently troubling American higher education, and might even succeed in aggravating those difficulties, (2) point out some dangers inherent in programs of institutional aid, and (3) explain why I believe student aid to be a policy better suited to place American higher education on a sound financial basis and more consistent with our educational objectives.

But in order to understand why institutional aid will not solve, and may indeed worsen, the peculiar financial difficulties now being experienced by colleges and universities it will be necessary to first review the convergence of circumstances which has made it possible for higher education to find itself simultaneously in the midst of a period of unparalleled wealth and financial troubles.

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The most fundamental of these circumstances is that education, and particularly higher education, is an industry in which dramatic economies in capital and labor inputs per student (or per degree) are almost unknown,[1] caught up in an economy in which average labor productivity advances at an inexorable 3 percent per year. Since the price level has risen at an average rate of about two percent per year over the past ten years (lower in the earlier part of the decade, higher more recently), money wages and salaries, on the average have risen at a rate of about 5 percent per annum. Even sectors of the economy in which productivity does not increase will be forced to increase the level of wages and salaries at this rate or else face the prospect of a rapid decrease in the quality of the labor available to them as they become less and less competitive.

If, for instance, higher education attempted to just maintain its current competitive position in wages and salaries, and if money wages and salaries in the relevant categories were increasing at the economy-wide average rate of 5 percent per year, and if non-wage and salary costs (e.g. for buildings and equipment) were increasing at the rate of increase of the price index, 2 percent per year, then cost per student will increase at a rate of:

5% times the proportion of university expenses which goes for wages and salaries (which happens to be about 60–70%)

Plus

2% times the proportion of university expenses which is spent on all other items (about 30–40%).

This explains why we would expect college cost per student to increase at a rate considerably in excess of the general rate of price increase.

But in addition to this fundamental circumstance, there are additional factors which have resulted in a rate of increase in expenditure per student considerably in excess of what we would expect from this simple calculation. Faculty salaries have not only maintained their relative position, but have increased rapidly relative to other wages and salaries. In 1965–66 faculty salaries were 152 percent of faculty salaries in 1957–58. In contrast, manufacturing wages increased to only 132 percent of their 1957–58 figure and retail wages increased to only 117 percent of their 1957–58 level. (Howard Bowen, "Faculty Salaries: Past and Future," page 16). The same inflow of money from government, private donors, foundations, and student tuitions which has made this rapid rise in faculty salaries possible has also resulted in a generally rising standard of the research equipment necessary for a "properly equipped university." More money and new technology have meant that computer time at our best universities is now available for undergraduates and that other equipment which might previously have been considered a luxury is now a necessity for "top-flight institutions." All this has meant that revenues and expenditures per student at our major private universities have been increasing at a rate of over 8 percent per year from 1959–60 to 1965–66 (on revenues see "Toward A Long-Range Plan For Federal Financial Support For Higher Education," U.S. Department of HEW. On expenditures see "The Economics of the Major Private Universities," by William G. Bowen).

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[1] It would not have been correct to say that *productivity* increases are "almost unknown" in higher education.

No doubt the increased future income (and productivity) resulting from a 1969 college education is far larger than the increased earnings which would result from a 1929 college education. Great strides in human knowledge have been made in the last forty years and these enable a contemporary college teacher to be more productive than his predecessors. One 1969 college degree is undoubtedly a far more valuable output than a 1929 degree and since the input of teacher manhours and capital has not increased proportionately, this represents an educational productivity increase.

Still, my point is that technological change in education is not of a nature which would allow us to realize major economies in our inputs of labor and capital *necessary for each* *student who receives a B.A.* and therefore labor costs in higher education per student must be expected to rise at a rate about equal to the rise in money wages and salaries in the economy generally.

I owe this observation to Professor Richard Freeman of Yale University.

To the extent that the financial troubles of higher education consist simply of the inability to increase expenditures per student in the future at the same rate at which they have been increased in the past, this may not be a social problem at all, but a perfectly normal and even desirable state of affairs.

After all, society has made no commitment to perpetually increase the relative economic position of college professors. It is doubtful, even now, if we take into account the extended vacations received by the academic profession, that faculty salaries are any lower at all, than non-academic salaries and they may even be higher. (According to Howard R. Bowan, "Faculty Salaries: Past and Future," "the salaries of educational institutions are about 84 percent of those paid by the Federal government and 78 percent of those paid in industry and business," and these estimates are based on a 9 to 10 month service with extended Christmas and Easter holidays. If we estimate that the average academic work year is only about 75–80 percent as long as the work year in government and business, then academic salaries would appear to be at least as high as salaries offered elsewhere.)

Indeed, casual empiricism would indicate that it is rare for university academic departments to be worried about the possibility of their faculty being permanently lured away to non-academic employment. They are often afraid of losing a prized colleague to another university, but this is a symptom of fierce bidding for scarce Ph. D's in an atmosphere of rapidly rising salaries, not of inadequate resources being devoted to higher education. And this observation receives strong support from the fact that the net migration of Ph. D's out of academic life has been almost zero for the entire period from 1954–64 (Allan M. Cartter, "A New Look At The Supply of College Teachers," page 272), and if the recent sharp increases in the relative economic position of college teachers have had any effect, we would expect the net migration rate, in more recent years, to be either zero or negative.

Nor is there any evidence that it is necessary to further increase relative economic position of college professors in order to ensure an adequate supply of new Ph. D's for the 1970's. Projections of past trends in the output of new Ph. D's, the proportion currently accepting jobs in higher education, and the future rate of increase in student enrollments leads to the conclusion that present trends will enable us to attract more than enough new Ph. D's to college teaching to increase the proportion of Ph. D's on college and university faculties at a very respectable rate in the 1970s. ("Future Faculty: Needs and Resources," Allan M. Cartter.)

The producers of any economic good can always think of productive ways in which they could use a great many more of society's scarce resources, but in most fields we have a market which makes sure (more or less effectively) that they do not use those resources past the point where the rising value of the resources to other sectors of the economy is just equal to the declining amount which consumers are willing to pay for the resulting output. No such market operates in allocating our scarce supplies of labor and capital to the field of higher education. All higher educational institutions are heavily subsidized by government, individual donors and foundations. In addition, the output in colleges and universities, particularly in the most heavily subsidized, is generally rationed by admissions standards and (especially in our big state universities) by failing out "substandard" students. Thus the total quantity of national resources available for higher education is determined not by a market but by the amount which universities can coax out of private donors, government bodies, foundations and students.

But even though we have ample reason to be skeptical of any claim that the problems besetting higher education stem from a general state of academic poverty, there is reason to believe that colleges and universities have financial problems which consist of more than the attempt by representatives of academia to persuade society to commit a larger proportion of its resources to higher education. The financial insecurity felt by so many institutions may well be caused by, and symptomatic of, the intense competition for academic prestige and distinction among competing institutions and not by the poverty of the higher educational sector as a whole. The following argument will attempt to demonstrate that these competitive strains are likely to be affected only slightly even by relatively large amounts of institutional aid and furthermore, that in the peculiar context of the dual price system within which higher education in America currently operates, these problems are as likely to be aggravated as to be alleviated by such aid.

THE DUAL PRICE SYSTEM

A dual price system exists whenever similar products are sold for different prices. This state of affairs clearly describes American higher education. Our public colleges and universities receive heavy subsidies from state and local government tax revenues while our private institutions receive much smaller public subsidies and even those government programs which do subsidize private institutions are also available to public colleges and universities. The result, of course, is that private school tuitions are much higher than public school tuitions and the gap in both absolute and percentage terms has been growing. In the period from 1928 to 1956, the ratio of private to public school tuition fluctuated in the narrow range from 1.52 to 1.65, but in the decade after 1956 this ratio increased steadily until in 1966 it reached the level of 2.07. Tuitions at private colleges and universities have probably been increasing at a rate of 5 or 6 percent per year since 1958 (William G. Bowen, p. 51).

Simple economics (or common sense) tells us that if a product is sold for two different prices, then the producer of the high priced brand had better find some way in which to differentiate his brand from his competitor's. Private colleges are somewhat more immune to the affects of a dual price system than are other economic enterprises since, as mentioned earlier, higher education is a rationed commodity, for which, by definition, demand exceeds supply at currently prevailing prices. Thus, even if the "product" offered by public and private colleges were identical, demand for (i.e. applications to) private colleges would not be zero. But if private colleges and universities wish to attract their share of the best students, as they clearly do, then it is imperative that they find some special appeal which will offset their higher tuitions. Private higher education has traditionally met this need in one of three ways: (1) they offer a religious affiliation and/or training not available at public institutions: (2) they offer a small, intimate liberal arts education; or (3) they offer a high-cost, high quality education to an extremely select body of students.

However the trend of the last fifty years has been in the direction of drastically diminishing the influence which religious affiliation has on the substance of a college education. This has been largely the result of the rise in the power of the academic departments and disciplines over the content of the academic program. Even prominent church leaders would be hard pressed, in all likelihood, to explain how Methodist economics differs from Episcopalian economics or Catholic economics. In many of the Protestant colleges the significance of the original religious affiliation has decreased almost to the vanishing point, and even in the Catholic colleges and universities any specifically Catholic influence on the curriculum is on the decline.

It is difficult to believe that this decline can or will be halted. No one seems to have much idea of what a specifically religious approach to most academic subjects would consist of and in the absence of such an idea, no one really has either the will or the power to impose a heavily religious approach on American higher education (for a more extensive discussion of this subject, see *The Academic Revolution*, Christopher Jencks and David Riesman). While this is probably all to the good in many respects, it nonetheless means that one of the most important ways in which private colleges and universities have justified their higher tuition is becoming a progressively less marketable commodity at just the moment when the tuition gap which necessitates such differentiation threatens to become truly enormous. For even if the trend of the last ten years was halted and public tuitions began to grow at the same rate as private tuitions, the absolute gap between them would still grow rapidly. If both public and private school tuitions grew at a rate of 5 percent per year, the dollar gap between a typical public and a typical private school tuition would also grow at 5 percent per year. The conclusion seems to be almost inescapable that the need for differentiation of private colleges is almost certain to increase in the future.

This combination of the declining role of religious affiliation and the rapidly growing tuition gap between public and private higher education can be expected to contribute to a feeling of insecurity on the part of those responsible for the future growth and prosperity of private institutions. What role will private higher education be able to stake out for itself which will justify these soaring tuitions?

It may be that the private sector has something of an advantage in the field of small high quality liberal arts colleges. Only 33 percent of full-time students enrolled in four year private institutions are in universities as opposed to 56 percent in the public sector. (*Opening Fall Enrollment In Higher education, 1967*) Professors and students who are attracted by the flexibility and lack of cumbersome administration which characterizes small undergraduate colleges are also likely to be attracted by autonomous institutional control. But it is far from clear that institutional autonomy will justify really large tuition gaps and even if it would the continued competitive viability of private liberal arts colleges is not likely to be enough to guarantee for the private sector a continued role in the mainstream of American higher education. Positions of prestige in academic life are increasingly associated with the publishing of distinguished work which is recognized as such by one of the established academic disciplines. There can be little doubt that a graduate program provides a far more fruitful arena for the type of research which typically leads to such publications. Only universities have the research facilities and eager pool of graduate research assistants which are often crucial to the research process. The result is that the bulk of the most capable new Ph. Ds inevitably head for the large and medium sized universities which then are able to gather most of the research contracts, money, prestige and top students.

If private higher education is to be restricted to providing a small, intimate, liberal arts education then the private sector will assume an increasingly peripheral role. The leadership in research, faculty salaries and involvement in the great policy issues of the day will pass to state controlled institutions.

The most important way in which the private sector can assure itself a continuing ability to attract its share (and more than its share) of the best students and faculty is by maintaining an ability to offer a high-cost, high quality education to an extremely select group of students. As long as private institutions can spend more per student than their competition in the public sector, and as long as they can at least maintain and preferably increase the size of this gap, they will continue to play a central role in the forefront of American higher education. As recently as 1963–64, all eight institutions which received an A rating from the AAUP on both average and minimum faculty pay scales were in the private sector. At the graduate level a study by the American Council on Education designated "leading universities" in the five broad fields of engineering, humanities, social sciences, biological sciences and physical sciences. From 56% to 78% of the leading institutions were private in each of the five fields (William G. Bowen pp. 4, 7).

Considering their limited access to public tax revenues the private sector has been surprisingly successful in the 1950's and 1960's in not only maintaining but in widening their edge over public institutions in expenditures per student. In the 1950's it was the private universities which took the lead in bidding up faculty salaries (William G. Bowen, p. 7) and from 1959–65 the rate of growth of per student revenues has been most impressive. During this period revenues per student increased at a rate of 8.1% at private institutions and only 4.0% at public institutions. In addition the faculty-student ratio in public institutions declined from 1956–66 but rose over the same period in private institutions. A slight decline in the proportion of faculty with Ph. D's from 1963–66 was borne completely by public institutions (HEW report, pp. 12–13).

To a large extent, no doubt, these improvements in the relative status of private higher education were a reflection of a deliberate decision by private school administrators that rapidly rising enrollments was a lower priority goal than academic excellence. As a result, the period 1959–65 saw the proportion of total income going to the private sector decline only slightly, from 45 to 44%, while the proportion of students enrolled in private four year institutions declined much more precipitiously from 45 to 38% (HEW report p. 12). The most plausible explanation for these trends is that public and private institutions are responding to a different set of pressures by creating a different set of institutional priorities.

Public schools frequently feel keen legislative pressure to admit all qualified high school graduates even at the cost of some decrease in quality of instruction. Private institutions have no comparable pressures to expand enrollments as fast (or faster) than the rate of increase of high school graduates but in view of the ominously widening tuition gap they do have a vital interest in making sure that their ability to attract good students is unimpaired. Quite apart from the pride any administrator must feel in being associated with an institution with a top academic reputation, private school administrators must also realize that an important source of their future income comes from alumni contributions. Today's students are tomorrow's alumni and today's top high school students have the best prospects of becoming tomorrow's well-to-do contributors. If the ability to attract the best high school graduates is lost it may be the beginning of a cumulative process of decline which will see a loss of income, and inability to hold good faculty, a further loss of attractiveness to students and an inability to raise tuitions to meet rising costs without driving away still more good students.

Thus the public sector evidently feels it necessary to expand enrollments at a rapid clip even if this results in a relatively slow growth in income per student. The private sector feels it prudent to accept a rapidly falling share of total enrollments in order to ensure themselves the continued ability to increase expenditures per student at a much more rapid clip than its competition in the public sector.

The system as presently constituted would appear to have built into it all the elements necessary to assure a state of permanent financial instability. The private sector feels it must constantly widen the quality gap which it maintains over the public sector in order to preserve its ability to attract top students. Equality with the leading public universities may not mean instant oblivion, but it will very likely lead to a cumulative process of decline which will make it increasingly difficult for these institutions to tap their normal private sources of funds and which could finally leave many private schools with the dismal choice of either catering to special corners of the higher education market or else providing a college education for those unable to gain admittance to a low tuition public school. On the other hand, if the private schools succeeded in raising sufficient funds to widen their lead over public schools, as they apparently have in the period up until 1965–66 (after which detailed financial data is no longer available) the almost inevitable result is that public colleges and universities begin to feel acutely dissatisfied with their deteriorating relative academic position. College administrators in the public sector, after all, can hardly relish the sight of their own institutions being consigned to permanent second rate status and a continuing inability to increase expenditures per student at the same rate at which it is raised in the private sector must eventually lead to this result.

This explains how it is possible for higher education to be richer and more heavily subsidized than ever before in its history, paying higher salaries relative to business and government than they have for at least the last thirty years, receiving unprecedented amounts of income from government research contracts and yet be showing signs of acute financial strain. Neither the riches nor the distress is an illusion. The financial distress is merely a symptom of the competitive pressures between institutions which are built into the dual tuition system.

An adequate level of funding for the higher educational sector as a whole is not necessarily an antidote to these competitive pressures and in fact we might even expect more acute dissatisfaction during periods when rapid increases in the level of funding are causing large changes in the relative wealth of different institutions.

INSTITUTIONAL AID

It should be clear by now that programs of institutional aid which propose to simply appropriate money and spread it around by means of a formula are an expensive and ineffective way to combat what is known in some academic circles as "the financial crisis in higher education." To any individual university president contemplating the financial problems facing his institutions it must seem clear that a relatively modest federal appropriation will eliminate his small but ominous deficit and transform the financial condition of his university from poverty to solvency. But it does not by any means follow that comparable quantities of aid spread over all colleges and universities will improve the competitive position of any of them.

The precise effect of institutional aid on the competitive position of each institution depends almost completely on the formula according to which the aid is distributed. A formula which gives great weight to enrollments will tend to narrow the percentage gap between expenditures per student in high and low cost institutions. A formula based on the rate of increase of enrollments will tend to be far more helpful to the rapidly expanding public sector than to private schools. Aid based on research contract awards, on the other hand, will tend to channel disproportionate amounts of money into the best and most expensive universities and particularly into the top private universities. By combining several of these criteria and weighting each properly a formula could no doubt be devised which would cause the minimum number of changes in the present competitive structure of higher education. Such a formula would simply raise the overall level of funding of higher education without altering significantly the present heirachy of academic prestige and quality.

The dual tuition system probably places some limits on our ability to select a formula designed to reduce the inequities in the wealth of colleges and universities. A pattern of aid which threatened to seriously erode the ability of the top private universities to maintain a quality gap great enough to justify their high tuitions might lead to just the kind of cumulative decline discussed earlier. An equalitarian approach to institutional aid is likely therefore to aggravate the competitive strains which are built into the dual tuition system.

On the other hand, a formula could be chosen which heavily rewarded institutional quality by basing aid largely on criteria such as number of advanced degrees or research contract awards. Such a program would indeed have the affect of making the dual tuition system more viable by strengthening the preeminent position of the top private universities. But it is highly unlikely that we would want to bestow disproportionate amounts of aid on those institutions which are already engaged in educating a very wealthy student body with the most expensive educational resources available. The country has better things to do with its tax dollars these days than to spend them making a major social institution more inequalitarian than it already is.

A more likely approach would have the aid formulas contain several different criteria, chosen and weighted in such a way as to leave the present academic hierarchy as unchanged as possible. Distributions of aid which undermined the competitive position of any group of institutions would be avoided and the formula writers would labor long and hard to give all institutions their "fair share" of the aid.

Federal programs which dispense money or benefits to groups outside the government seem to have a powerful tendency to develop a constituency and a political life of their own. Institutional aid could be expected to follow the same pattern. Those in charge of writing and revising the aid formulas (whether they be a congressional committee or an agency in the executive department) would undoubtedly be inundated with lengthy and persuasive papers from individual institutions or from groups of institutions seeking to demonstrate that: (a) according to some ingeniously devised criterion they had received less than their share of the aid, and (b) their own continued prosperity was an essential prerequisite to having a healthy and effective system of higher education. This vocal constituency would no doubt create a keen sensitivity among the formula writers to the financial problems of each institution and a strong inclination on their part to minimize the causes for, and hopefully, the volume of, complaints by giving each institution a "fair share" of the total aid budget. In practice, a "fair share" for each institution would probably mean giving each institution just enough to maintain its traditional position in the academic hierarchy. Now this is not to claim that the formula will be constantly manipulated so as to make sure that no institution ever suffers a decline in quality. Some institutions will be poorly administered or will face a disappearing market and there will be no practicable way to prevent their decline. But it does seem probable that aid by formula will have a tendency to slow down or stop any major changes in the relative status of classes of institutions (e.g. large public universities).

When I was working at the Department of Health, Education, and Welfare the past summer, the Office of Education was already busily engaged in attempting to devise formulas which would give each institution just such an equitable share of the aid.

In all likelihood the formula writers' desire to preserve the competitive position of as many colleges and universities as possible would occasionally be tempered by the desire to reward those institutions which it is felt are making the most productive use of educational resources or whose research and/or teaching make their continued prosperity especially important to the national interest.

It may not sound like a particularly awful arrangement to have a trained group of government experts distributing aid to our institutions of higher learning with an eye toward dividing the money up equitably among schools and encouraging educational productivity. Nevertheless I am convinced that in addition to solving very few financial problems aid by formula will politicize and bureaucratize decisions about resource allocation *within* higher education in a most unfortunate way and that strengthening the role of the market through expanded programs of student aid will have superior educational and social results on virtually every major count.

MARKET PLANNING VS. CENTRALIZED PLANNING

It should be noticed in this regard that it is one of the chief virtues of an unfettered market that it is neither fair nor equitable in allocating resources among producers. A market makes no attempt whatever to guarantee producers an indefinite continuation of their competitive position. On the contrary, it allows consumers to vote their preferences using dollars as ballots. Producers who are successful at maximizing value of output and minimizing cost tend to thrive and expand—those who fail tend to wither and contract. A market allows and indeed institutionalizes a process of continuing upheaval in competitive relationships while producer subsidies often tend to preserve the existing relationships between producers.

Now we quite properly feel that a student's access to higher education should not be determined by the number of such dollar "votes" available to him. To allow a young man's own wealth to determine his educational opportunities would partially close one of the most important doors to equality of opportunity for children from poorer families. Government is justly concerned with prying open such doors not shutting them.

It is one of the chief drawbacks of institutional aid that it shifts the focus of the government's attention from the problem of finding an equitable and efficient distribution of aid among students to the problem of finding an equitable and efficient division of educational resources among institutions. And this is a problem which is not amenable to a satisfactory centralized solution.

Should colleges and universities be large or small? Should they be in urban areas or in rural areas? Should they alter the ratio of junior to senior faculty? Should classes be larger or smaller? Should more money be spent on libraries or on computers? . . . These and hundreds of other large and small choices and trade-offs can no doubt be influenced by tinkering in a suitable way with the aid formulas. How decisively this tinkering alters educational decisions is likely to depend on the determination of the formula writers and/or the importance of formula aid in college and university budgets. But unless the formula writers are simply content to maintain the status quo or give out aid that satisfies some other arbitrarily chosen definition of fairness, they will no doubt engage in such tinkering from time to time.

Still, it is precisely in this type of tinkering with details of resource allocation within individual sectors of the economy that centralized planning generally turns out to be a clumsy and ineffective device lacking most of the sublety and respect for small distinctions which makes a market such a sensitive mechanism for satisfying individual preferences.

Even were we to assume that the formula writing and revising was done by a brilliant group of technicians, oblivious of all self interested lobbying and singlemindedlly intent on encouraging the most socially useful and productive of our colleges and universities, this objection to a centralized allocation of educational resources loses little of its force. Suppose, for instance, that after careful research the formula writers conclude that higher education is characterized by increasing returns to scale. They might come to this conclusion after finding that expenditures on such essentials as libraries, computers, lab-equipment and administration failed to increase proportionately with enrollments and that there were no decreasing returns to scale affecting other inputs sufficiently large to offset these declining per student expenditures. The policy conclusion would be that inputs per student are smaller in a large school than in a small one over the whole existing range of school sizes and that formulas should be written in such a way so as to encourage rapid growth of small schools, mergers, or other policies which would lead to a consolidation of American colleges and universities into a small number of giant institutions.

This example illustrates one of the classic pitfalls of dispensing with a market in micro-economic decisions concerning resource allocation. It is indeed desirable to maximize output per unit of input and to do so, is by definition, to increase economic efficiency. But as anyone young enough to remember his college days must realize, a small liberal arts college is not the same output as a large urban university. If students are willing to pay the difference in costs plus interest out of their future incomes for the privilege of enjoying an intimate, integrated liberal arts education—then it is difficult to see why this is not at least as reasonable a consumer choice as the decision to purchase no-frost refrigerators, night club tickets, or barbecue grills.

Of course our intelligent formula writers might realize the value of small liberal arts colleges but only a market can provide us with information on the precise value of this product to the student and only a market will tend to provide an additional service if and only if the increased value of output exceeds the increased cost. The sensitivity of a market then derives from its comprehensive consideration of costs and benefits in evaluating alternatives and the precision with which it measures and applies this information.

A closely related drawback of aid by formula is that in an area in which our goals are as subtle and complex as they are in higher education it will be difficult to design a formula which rewards and encourages educational excellence without simultaneously encouraging an educational system which strives to excel partly in sterile formula beating. Formulas can occasionally be relatively effective substitutes for a market where the criteria for success are simple and straightforward. We might expect, for instance, that we could base the salary of the manager of a state-owned electric trust on maximizing the output in kilowatt hours (with a fixed costs constraint) of a nice, simple undifferentiated product like electricity and get reasonably good results.

But even areas which seem relatively simple become far more complex when one tries to divorce oneself too completely from market criteria on cost and value of output, as many a Soviet planner has found much to his chagrin.

When a Soviet production manager's bonus pay was made dependent on the total weight of nails produced, the Soviet economy found itself with an acute shortage of little nails. When the pay of a hydroelectric manager was made partially dependent on how little of his own hydroelectric power he used, planners found that hydro-electric station managers were building their own inefficient gasoline generators just to supply the needs of the dam complex.

Yet producing nails and electric power is relatively simple compared with our complex, subtle and often intangible objectives in producing higher education. We want education to maximize the contribution individuals can make to national income, maximize the present enjoyment (consumption benefits) students derive from their education, and maximize the future satisfaction which citizens are able to obtain from the cultural advantages of having had a college education. The decisions required of a college administrator who wishes to maximize the value of even one of these three "outputs" are clearly both numerous and complex. To maximize the total value of all higher educational outputs (while keeping within some cost constraint) is an immensely complex task which can only be approximated by a painstaking process of trial and error over a period of time. But a formula can only measure an administrator's success using a few relatively crude measures of output or input (eg. enrollments, expenditures, degrees granted, or research contract awards). Since the criteria for maximizing income from the formula are necessarily far simpler than the criteria for maximizing the satisfaction of students, it is always possible to make educational decisions which increase government aid without improving educational quality.

To illustrate this point let us take a brief look at the probable effects which the formula contained in the Miller Bill might be expected to have on educational decision making. This bill was introduced in both the 89th and 90th Congresses and it is probably a fairly typical example of what we can expect an institutional aid formula to be like.

The Miller Bill authorizes $150 million dollars to be distributed among various colleges and universities according to a three part formula. $50 million would be distributed among the different institutions based on each institution's share of the total number of science credit hours taught in its State. (The $50 million is first divided among the States based on each State's proportion of the nation's high school graduates).

A second $50 million would be awarded to institutions based on the value of research project awards from three Federal agencies (NIH, OE, and NSF) with a limit of $300,000 on the amount which may go to any one institution.

The third $50 million in the Miller Bill is allocated on the basis of earned master's and doctor's degrees in the sciences during the immediately previous three years.

College presidents have always been chosen partially for their excellent fund raising ability. If the Miller Bill were passed (and the level of funding were subsequently raised), it seems likely that the college president of the future would have to become something of a wizard at juggling with academic standards in order to produce a university which would be tolerable from an educational point of view and would also give his university the highest possible rating in the formula.

For instance, if the chairman of some department felt it would improve his program to institute some rigorous new requirement for the Ph.D, the President might be forced to veto the proposal on the perfectly rational (from the university's point of view) ground that the Federal subsidy lost as a result of the decrease in advanced degrees awarded would be more valuable than the improved educational standards resulting from the new rule.

In addition, the Miller Bill threatens to enshrine the Ph.D into Congressional statute. This would make it more difficult for individual universities to experiment with different sorts of degree programs at just the time when such experimentation is sorely needed.

Or, to take another example of more current concern—it is a widespread complaint among many undergraduates, particularly at our large public universities, that most of the faculty time and interest is lavished on graduate students and research and very little is left for the pedestrian task of teaching them. By allocating one-third of the aid on the basis of research contract awards, the Miller Bill might, in all sorts of little ways, pressure universities to place an even heavier accent on research. And this would happen even if the market value that students were willing to pay out of their future incomes for the consumption and investment benefit of better teaching far exceeded any estimate of the value of the research.

There are many ways in which a university which is hungrier for research contracts than for competent teaching can make this painfully apparent to all concerned. At one large mid-western university there is already a small pay differential between graduate students who work as research assistants and those who work as teaching assistants. Making university budgets even more dependent on research contract awards could easily result in widening such differentials where they already exist and creating them where they do not, thus effectively channelling all the best graduate students into research.

STUDENT AID AND THE PROPER ROLE OF GOVERNMENT IN HIGHER EDUCATION

The major alternative to aid by formula is to enhance the role of the market in allocating resources within higher education. A market enables consumers (in this case students and their families) to make the choices which result in society's allocation of resources by providing consumers with a set of prices which serve as signals indicating the social cost of different commodities or of different variations of the same commodity. Consumers then buy the bundle of goods which maximizes their satisfaction within the limits imposed by their incomes. In addition, a proper market should allow consumers to purchase durable consumer or producer goods which yield a stream of returns over a number of years (e.g. a car, a house, a factory) by borrowing and repaying out of their future income.

It follows then that increasing the role of the market in allocating resources within higher education can only be accomplished by some combination of the following three policies:

(a) Increase the proportion of educational expenditures covered by student fees and tuition. This will not only result in making student charges perform the same function as any other price; i.e. indicating to the student the social cost of higher education and inducing him to consume more expensive forms of higher education only if he expects equally valuable benefits—but it will give a powerful incentive to college administrators to provide the type of education which attracts students or else face a swift loss of their most important source of revenue, and with it a loss in the size, power and prestige of the institution over which they preside.

(b) Make the proportion of educational expenditures covered by student charges more uniform among different institutions. This would force students to choose between competing institutions on the basis of real social costs and personal benefits, not on the irrelevant basis of how heavily subsidized different institutions happen to be.

(c) Make it possible for students to pay their college tuitions and living expenses out of their future incomes. This would not only end the bias against investment in education which the difficulty in obtaining such loans creates, but unlike a student aid program consisting solely of grants it would give students an incentive to economize on educational expenditures to the greatest extent consistent with maximizing their own satisfaction. A price system and a market should make it possible to decentralize decisionmaking about resource allocation. If a program of guaranteed long term loans is linked to the reforms in the tuition system already mentioned, it will enable us to leave the decision as to the proper trade-off between higher-cost and higher quality largely to the judgment of the individual student. If he feels the benefits from a more expensive education are worth a larger obligation to repay out of his future income then he should borrow the money, otherwise the scarce funds will go to someone who feels better able to make productive use of them.

As a practical matter, this means sharply raising tuitions at public institutions and enacting a program of long term student loans. The details of such loan programs have been carefully spelled out elsewhere (*The Educational Opportunity Bank: An Economic Analysis Of A Contingent Repayment Loan Program For Higher Education* by Karl Shell, Franklin M. Fisher, Duncan K. Foley and Ann F. Friedlaender. A less radical proposal which avoids some of the problems with the Educational Opportunity Bank is outlined in appendix D to the HEW report cited earlier) but it should not be forgotten that to be as fair and as effective as possible a proper program of student loans should allow the student to pool the risk that he will have to pay back his loan out of a relatively modest future income. Some good students are liable to be wary of incurring a large fixed debt at a time in their lives when their future income prospects are very uncertain. This pooling can be accomplished either by making the repayment obligation in the form of a fixed percentage of future income for each $1,000 borrowed (as proposed by the proponents of the Educational Opportunity Bank) or, less radically, by incorporating certain partial loan forgiveness provisions for those whose incomes fall below a certain level. In addition, a loan program which seeks to maximize the college alternatives open to students at all income levels should reduce to a minimum the burden of education expenditures which must be paid in cash. A really effective loan program should allow the student to borrow enough to pay most of his general living expenses in addition to the full cost of his tuition and fees.

None of this is to imply that the government has no role in American higher education except to guarantee loans, pool risks and collect the repayments. First of all we may want to give special encouragement to poor students to attend college. This could easily be accomplished within the framework of a student aid package by including a program of Educational Opportunity Grants. Such a program would give scholarships to poor students admitted to college and universities with the amount of the help determined by family income. (Such plans are described in Shell *et al* and in the HEW report appendix D.)

A second legitimate justification for a government role in higher education concerns the matter of the externalities which tend to be associated with the production of knowledge. Research and teaching by their very nature result in the "production" of a host of ideas, some of which may play a seminal role in stimulating a long chain of other discoveries which may finally lead to an economically useful innovation. But it is generally impossible to sell the idea at the beginning of the chain both because an idea has a way of quickly becoming common property and because its true value is generally only dimly perceived when it was first discovered and it is rarely possible to value accurately its worth in the web of discoveries which led to the profitable innovation. As a result we can expect the true social benefits which flow from the production of knowledge to be far greater than the amount which it would be worthwhile for any private company to invest in basic research. The upshot of this is that research and particularly basic research must be financed primarily by the government. Since education and particularly graduate education is part of the knowledge producing process, we may expect the total social benefits from higher education to be greater than the private benefits to the student.

Education may also produce other external benefits such as making citizens into more tolerable neighbors, enhancing the viability of democratic government (although anyone who reads the newspapers these days might have his doubts) etc. These external benefits plus most people's general prejudice in favor of an enlightened citizenry probably constitute an adequate justification for the nation to invest more in higher education than would be demanded by individual students borrowing funds at the market rate of interest. But adequate subsidies to the higher education sector of the economy can easily be worked into a comprehensive student aid package simply by making the terms of the grants more generous and/or (depending on whether we wish to direct all of the additional subsidy to poor students or wish to spread it around to all students) by decreasing the interest rates on the student loans. Even a small reduction in the interest rate on a thirty or forty year loan would amount to a large subsidy and a large reduction in the cost to the student. (For instance, in Shell *et al* it is shown that in the case of a forty year repayment period to the Educational Opportunity Bank, reducing the interest rate from 4.9% to 3.3% would halve the percentage of a student's future income which he was obligated to pay back to the bank. The reduction would be from .5% to .25% per $1000 borrowed.

Externalities may occasionally provide a reasonable justification for more selective intervention by the state in higher education. The "comprehensive and precise" consideration of costs and benefits which I earlier claimed as an advantage of markets in allocating resources applies only to those benefits actually enjoyed by the student. If higher education produces "external" benefits to society in addition to the direct benefits reaped by the student, then, as noted above, some government subsidy to higher education is necessary if the optimal amount is to be produced. But if the proportion of "direct" to "external" benefits produced by all types of higher education is the same, then there will be no need for government to interfere in the allocation of resources within higher education. It is only if some forms of higher education are more "loaded" with external benefits than others that it becomes necessary for government to influence some of the trade-offs within the higher educational sector. No doubt there are instances where we feel that society should subsidize one form of education more heavily than another. Graduate education or instruction in the sciences might be thought to yield an especially high proportion of external benefits and these would justify special subsidies. But these subsidies can always be provided for by simply increasing the generosity of scholarship aid in these areas or by including partial loan forgiveness clauses associated with certain types of employment.

Student aid is therefore a flexible instrument which can be used to fulfill the major public objectives (aside from supporting research) in higher education. Specifically, student aid can effectively: (1) increase equality of opportunity, (2) provide any desired level of subsidy to higher education, and (3) provide differential subsidization for different types of higher education where necessary.

But it seems fair to assert that in the case of the vast majority of educational decisions we have no reason to believe that either alternative is more heavily loaded with external benefits. In this situation it seems to be most sensible to make it possible for students to maximize the value of the "direct" benefits provided by higher education by allowing their choices to determine the allocation of resources within the higher educational sector. This can only be done by giving students the same ability to bid resources into the types of schools they want which consumers in other sectors of the economy enjoy. And this in turn implies that we embark on a policy of encouraging tuitions to more nearly cover costs and adopting a well thought out program of student aid. A higher educational system financed in this way would have the following advantages over the present system:

ADVANTAGES OF STUDENT AID

(1) It would result in an end to the differential subsidies (or dual tuition system) presently enjoyed by public institutions and as a result it would mean that all schools would compete for students on more nearly equal terms. Under the present system public schools operate in a protected market under the umbrella of a huge tax subsidy. They offer free or low tuitions to students who live in the right city or state. As a result those students become a captive market. If a private school offers a more attractive education than a public school and both have equal marginal costs (or if the private school has lower marginal costs) then the private school is using resources more efficiently and barring some unequal loading of externalities discussed earlier, we would like to see it expand at the expense of the public institution. But as the system presently operates, if students find the University of California at Berkeley a large amorphous institution which pays too little attention to its undergraduates, there is, nevertheless, very little which most of them can afford to do about it.

A related point touched on earlier is that a market maximizes a more comprehensive and humane concept of efficiency than a central planner ever can. The school which produces the most productive professionals (or in more operational terms, which adds the maximum increment to a students future income) at the least cost may maximize efficiency from the planner's point of view but once we realize that education has a consumption as well as an investment component it should be clear that this school will not necessarily maximize real economic efficiency. Only the student can really decide how much he is willing to pay, either in the form of a smaller future income or in the form of higher tuitions, for an education which he finds more congenial, relevant, and stimulating.

(2) Raising public school tuitions and making large amounts of grant and loan money available to students will tend to increase the demand for private higher education (or, more precisely, will tend to shift outward the demand curve facing each private institution). Increased demand will mean that private schools will be less likely to be priced out of the market by present tuition increases and more able to increase their revenues by raising tuitions more rapidly without losing their ability to attract good students. This should ensure the continued ability of private higher education to exist on a sound financial basis and will strengthen the autonomy and diversity of American colleges and universities generally.

(3) A loan program will distribute the considerable burden of financing higher education more equitably.

It will render it unnecessary for parents of modest incomes to foot most of the bill for an expensive investment which will deliver its returns in a stream over their children's entire working lifetime. This should remove a considerable source of anxiety from the financial plans of many middle-income families.

A loan program will also remove from students with little parental financial support the burden of working at a poorly paying part-time job while pursuing their education. Even the relatively small numbers of students from poorer families who are admitted to higher educational institutions tend to have a disproportionately high dropout rate (Froomkin, pp 1, 12). Surely we should not wish to add to the handicaps imposed on students from poor (and even middle-income) families by forcing work at a menial job to take up time which more fortunate students can use to pursue their studies.

And surely it is an example of gross inefficiency in the workings of our capital markets when students who will soon be earning $10,000 per year are forced to eke out a minimal existence with the aid of a menial job paying $1.25 per hour.

It is quite possible that a sharp rise in tuitions combined with a large scale loan program could lead to a rise in demand for college education, particularly among poorer high school graduates. This would result if the effect of the loan program in improving the operation of the capital market facing students more than offset the effect of the increased price of the education. Even if the loan program did not fully offset the effect of the higher tuitions, a program of grants aimed specifically at low income students whose decision about college attendance is particularly price elastic (i.e. sensitive to cost changes) would be more efficient in increasing demand than would an equivalent sum of money used to provide reduced tuitions for all. (For evidence on price elasticity of college attendance broken down by family income level, see the reference to the work of Dr. Stephen Hoenack in the HEW report cited earlier as well as his paper in this volume).

(4) Many people are aware that student deferments and accelerated draft calls have created a less than ideal student attitude toward their education. But it seems to me that the draft situation has combined with the relatively slight student obligation to pay for the direct cost of their education (either because of heavily subsidized tuitions, or because of the well known capital market imperfections which force parents to foot the bill) and the widespread student impression that producing a stimulating, relevant undergraduate education is a goal with a distinctly low priority in most schools, to create a thoroughly unfortunate student attitude toward higher education. Many students have come to view their undergraduate years as a free but rather dull sanctuary from a greater evil.

This is precisely the wrong attitude on every count.

It produces resentment against the college administration and society alike and leads to a college community filled with far too many students who have no idea what they are doing there.

A student who has not developed any strong academic or professional motivation to attend college should not feel trapped in school. Exempting college students from the draft has had an enormously corrosive effect on the morale of many college communities.

Instead of viewing college as a lesser evil, a student should realize that a year in college is a costly business, frequently requiring several thousand dollars worth of labor and capital which could be employed productively elsewhere. If a student does not believe that he is receiving professional training and/or a stimulating and relevant education which justifies this expense, he should feel free, indeed he should be encouraged, to make better us of his time. A few years of work outside of school can often produce more serious students with a more clearly defined academic or professional goal.

But if we are really to have students who value their education, it is also necessary that they see concrete and continuing evidence that providing a relevant, stimulating, and productive education is the central concern of college administrators and teachers alike. They must not have reason to believe that teaching is a peripheral matter in the affairs of a great university to be worried about in an administrator's spare time when matters more central to the institution's prosperity and survival have been taken care of.

In order to create a more desirable set of student attitudes we must: (a) end the special draft status enjoyed by students (or abolish the draft) (b) encourage students to pay the bulk of the direct costs of their education out of their future incomes (c) make the prosperity and survival of colleges and universities directly dependent on their ability to attract students in open competition a free market.

Draft reform, a greatly expanded program of student loans, and an end to the dual tuition system, would accomplish all three goals and might go a long way toward both improving the quality of the education offered to undergraduates and reducing the frivolousness and sense of alienation which too often characterizes student attitudes toward their education.

Tentative empirical confirmation of the link between tuition financing and educational excellence comes from a study of a sample of 40 major public and private universities done by Professor Richard B. Freeman of Yale university. Using data for the year 1962, Professor Freeman attempted to determine which variables account for the variance in the faculty-student ratio among 40 institutions. Not surprisingly, Professor Freeman found that the most important single factor was the institution's income per student which showed a strong positive correlation with faculty per student. But in addition the multiple regression equation shows a smaller but still significant positive correlation between average student fees and the faculty-student ratio. There was also a significant negative correlation between government aid per student and the faculty-student ratio. Since all three variables were included in a single multiple regression this would tend to indicate that even after the affect of increased income per student is accounted for, schools which rely for support more on student fees and less on government support tend to have more faculty per student and presumably (though not necessarily) smaller classes and more personalized instruction.

The most plausible explanation for this finding is that schools which charge steeper tuitions must attract students who have the means to go elsewhere, while low tuition government institutions have a captive market composed largely of state residents.

No doubt a much larger study using more, and more sophisticated, variables than this one would be needed to determine the precise relationship between methods of financing and educational quality. Professor Freeman does furnish us, however, with some preliminary evidence that consumer sovereignty and competition in education, as elsewhere, may be effective tools for making a major American industry more respective to the preferences of its consumers.

A FINAL WORD

Up to this point I have discussed the proposal for full tuition financing and for a comprehensive program of student aid as if they were part of an inseparable package. This has been a matter of convenience and I do not want to leave the impression that both parts of the proposal must be enacted in order to realize the benefits already discussed. Congress does not, after all, have the authority to raise public college tuitions and if the success of a student aid program depends on a simultaneous scrapping of the dual tuition system then the whole idea is a practical impossibility.

But in fact, even if the gap between public and private school tuitions is not narrowed at all, a generous program of long term loans (hopefully, though not necessarily supplemented by a program of grants to poor students) should have most of the salutory effects mentioned previously, albeit to a lesser extent.

Long term loans would strengthen consumer sovereignty in higher education by giving students a wider range of choice in picking their school; it would therefore partially destroy the captive market of the public institutions; it would shift outward the demand for private higher education and would thereby prevent private schools from pricing themselves out of the educational market; it would make it possible for all students, regardless of parent's income, to attend any school to which they could gain admittance. It should be noted that with the exception of the last objective, student aid alone would not be as effective as the combination of student aid and an end to the dual tuition system.

If Congress made long term educational loans readily available to all full time students, it should make it easier for State legislatures to cut down on their skyrocketing subsides to higher education. State expenditures on public higher education more than doubled from 1959–65, increasing from $1,353,000,000 to $2,947,000,000. This was an annual average rate of growth of 13.9% (HEW report, Appendix A). In view of the escalating financial difficulties facing many state governments, the existence of a large scale Federal loan program might well tempt many state legislatures to cut down these subsidies or at least slow down their rate of growth by raising tuitions faster than they otherwise might have. Any resulting narrowing of the tuition gap should improve the operation of the educational market by forcing students to choose schools on the basis of real costs and benefits instead of on the socially irrelevant basis of the size of the subsidy.

If a Federal loan and grant program did induce states to raise public school tuitions faster than they otherwise would have, it would have the side effect of redistributing the burden of government spending on higher education from the States to the Federal Government.

Educational Opportunity Through Student Loans: An Approach to Higher Education Financing

*Jerrold R. Zacharias**

INTRODUCTION

As I write this paper, Harvard, America's oldest and greatest university, is being torn apart by student dissent. The same and much worse is true in many parts of this country and almost all over the world. Up to the moment of writing at least, MIT is not completely serene, but life is manageable and quiet enough for most faculty and students to work on problems of research, on the specific discipline that they came to MIT to work on or to learn. Let me try to identify some of the reasons and causes of student disruption in this country, difficult and tentative as this analysis may be, and to propose some basic remedies which might relieve the immediate stresses and set a basis for sound reform for the long pull.

At an MIT colloquium discussion of the teaching of physics at Moscow State University, a visiting Russian Academician, Lev A. Artsimovich, remarked that the students at Moscow State University were not disruptive—they are too busy. These students have thirty-five hours per week of meetings with faculty, more than three-quarters of which are in the form of lectures or seminars. Imagine: they absorb facts all day and study each night, preparing for highly competitive and difficult examinations. The physics students study no subjects but mathematics and physics. We have seen the product of such narrow and forced discipline. Having seen it in Germany, we surely do not want any such thing here, and some of us are afraid of it in the U.S.S.R.

The situation at MIT is different from Moscow State University, but not entirely. Most of the students at MIT work diligently on narrow disciplines—a greater variety than do students at Moscow State University to be sure—but they work mostly on topics and at paces set by the faculty, set by the traditional styles of learning and of evaluation, by examinations and the subsequent awarding of credentials. This method has long been used but never sufficiently examined. I regard these traditional styles as intellectual prisons, and so do many of the students. In an attempt to engender breadth of understanding, most American college students are required to study at one time—and often for four years—four or five disparate subjects. No professional humanist, engineer, natural scientist, or social scientist works this way, either on research or while he is trying to learn a new subject. He puts his full effort into what he is doing, narrow as that may be. And if he broadens his knowledge, he does so by going at different subjects this way at different times. One can disagree by citing examples of the physicist who plays quartets some evenings or the lawyer who is an amateur astronomer. But the important issue is that the faculties of the colleges require their students to work and learn in a way that they would recognize as unrealistic, if they thought hard about how they themselves function. There is no basis for complacency about the effectiveness of our educational system. The traditional patterns of educational requirements have not produced a really educated public, one which respects learning and creation at least as much as it does wealth, possessions, or adornments. This makes me sound as if I wanted everyone to be as serious as I am when I am serious, and as frivolous as I am when I am frivolous.

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No, the problem is that by tradition we are not supposed to enjoy our work, that we should not want to work for its own sake. I was a Boy Scout, and I was supposed to be "trustworthy, loyal, helpful, friendly, courteous, kind, obedient, cheerful, thrifty, brave, clean, and reverent." Say these words slowly. There is no sense of delight, no feeling of choice; no word suggests that you have examined what you are doing and are doing it because it is what you really want to do.

Now, with that statement of where I stand, let's look at the college disorders. The students at Moscow State University, we are told, are not striking, revolting, or burning chapels. Neither do we hear that they are being clubbed, gassed, or expelled. They have heard of Siberia and fear it, but they want to study what they study because they know it is by far the best route to a full life in a country whose customary policy it is to bend the individual to the purposes of the state. Take the case of Andrei Sakharov, the man largely responsible for inventing the Soviet H-bomb. He wrote, with consultation and help from many of his colleagues, a manifesto which was published in its entirety in *The New York Times* of July 22, 1968. It would be a remarkable document for an American; it is super-remarkable for a Russian in the U.S.S.R. Let me quote.

> "In conclusion, I will sum up some of the concrete proposals of varying degrees of importance that have been discussed in the text. These proposals, addressed to the leadership of the country, do not exhaust the content of the article.
>
> (1) The strategy of peaceful coexistence and collaboration must be deepened in every way. Scientific methods and principles of international policy will have to be worked out, based on scientific prediction of the immediate and more distant consequences.
>
> (2) The initiative must be seized in working on a broad program of struggle against hunger.
>
> (3) A law on press and information must be drafted, widely discussed and adopted, with the aim not only of ending irresponsible and irrational censorship, but of encouraging self-study in our society, fearless discussion and the search for truth. The law must provide for the material resources of freedom of thought.
>
> (4) All anticonstitutional laws and decrees violating human rights must be abrogated.

> (5) Political prisoners must be amnestied and some of the recent political trials must be reviewed (for example, the Daniel-Sinyavsky and Galanskov-Ginzburg cases). The camp regime of political prisoners must be promptly relaxed.
>
> (6) The exposure of Stalin must be carried through to the end, to the complete truth, and not just to the carefully weighed half-truth dictated by caste considerations. The influence of neo-Stalinists in our political life must be restricted in every way (the text mentioned, as an example, the case of S. Trapeznikow, who enjoys too much influence)."

Ideas like these might well be regarded as treasonous in all but a few countries of the world. In fact, many of us who read the paper were fearful for Sakharov's safety. But he is evidently not in jail, nor indicted. He is free to work on physics. And, so I am told, are all of his colleagues who helped with the famous paper—free to work as they choose. It may not surprise anyone to learn, however, that Sakharov has lost his security clearances, his privilege to work on military weapons or government committees, just as J. Robert Oppenheimer lost them here in 1954. But Sakharov has not lost any of his prestige, his freedom, or his friends. He is protected by his intellectual powers and his intellectual achievements. He and the like of him are regarded as a resource that his country cannot easily do without.

But what is my point in bringing up Sakharov? I am told that in Russia—Czarist and Soviet—there has long been a tradition of great respect for the intellectual. Learning is one major road to a full and enjoyable life, even in an otherwise highly suppressive society. Why should a university student fight what is the best way for him to achieve full status in the intelligentsia, with its bounty of internal and external rewards?

What is the matter in our country? Our students have freedom. Indeed, as citizens, they enjoy all of the freedoms; as students, very few. In our colleges and universities we try to educate a large fraction of the public for lives which do not require continual involvement in intellectual matters in order to remain wealthy, healthy, and frivolous, or, for that matter, trustworthy, loyal, helpful, friendly, courteous, kind, obedient, cheerful, thrifty, brave, clean, and reverent.

Here is a statement made in a speech at Yale University in April 1969 by John V. Lindsay the Mayor of New York City.

> "If you wonder why so many students seem to take the radicals seriously, why they seem to listen to clearly unacceptable proposals and tactics, ask yourself what other source in the past has won for itself the confidence of young people.
>
> "Is it the Government telling us that victory in Vietnam was around the corner, or that we fight for a democratic ally that shuts down newspapers and jails the opposition? Is it the military, explaining at Bentre that 'it became necessary to destroy the town in order to save it'? Is it the moralizer, warning of the illegality of marijuana smoking as he remembers fondly the good old days of illegal speak-easies and illegal bathtub gin? Is it the television commercial, promising an afternoon of erotic bliss in Eden if you only smoke a cigarette which is a known killer? Is it the univer-

> sity, which calls itself a special institution, divorced from worldly pursuits, while it engages in real estate speculation and helps plan and evaluate projects for the military in Vietnam?"

The Mayor's statement includes many sources of students' discontent, but omits what is to me one of the most important: the unsatisfactory state of our educational system. Awareness of this additional trouble helps us to see why our students are behaving as they are. I am not referring to the radicals, the leaders of the extreme left or right. I refer to that large number of moderates from the middle class whose frustrations lead them to support the extremists in any disagreement with authority, be that authority the administration, faculty, or the police. Some of us in the colleges and universities try very hard to listen to the students, but it is sometimes difficult to decode their messages. Perhaps they are saying, "We are imprisoned in the educational system; we are frightened by war and threats of war; we are appalled by injustices; and we are paralyzed by the feeling of powerlessness that is shared by the public generally." If this is what the students are saying, then we understand. But this is only our best guess.

As professional educators, what could we do to help? What should we do? First let me quote from a speech by Stephen J. Tonsor, Associate Professor of History at the University of Michigan, a speech endorsed by President Nixon. The speech appears in the May 5, 1969 issue of *The Chronicle of Higher Education*.

> "The possibility for educational diversity in America is immense; but in reality American education is homogeneous and uniform.
>
> "The privately endowed colleges do poorly what the state universities do only a little better, and a handful of determinative major universities, as alike as peas in a pod, set the tone and direction for the whole educational enterprise.
>
> "American education has become a single mechanism, its professors and students interchangeable parts. Under these circumstances, even student riots are monotonously, repellently, alike.
>
> "Among the most important functions of education is that of widening the options available to men in the solution of their problems and in the improvement of the quality of their lives, yet our universities steadily diminish and dilute the differences between themselves.
>
> "Students are still able to choose the quality of their educations; they are unable, however, to do much through their own choices about the kind of education they receive.
>
> "It is important that we re-establish a free market in education.
>
> "It is important that the church-related schools survive, not as a secularized ghost of its former self but as a school with a genuinely religious vision of the world, a school in which men learn to serve God and their fellow men rather than themselves.
>
> "It is important that private humanistic colleges with their commitment to civilization and decorum and their quiet emphasis on freedom remain an important constituent of our educational system.
>
> "We cannot have this diversity, however, until the Federal and the state governments drastically alter the role they play in financing higher education.

> "American education will become diverse and relevant to the needs of both the student and the nation when, and only when, the student is forced to pay a very substantial portion of the total costs of his education . . .
>
> "State schools which compete unfairly with private schools through discriminatory tuition rates have been the chief force in leveling and homogenizing American education.
>
> "Indiscriminate Federal grants on the basis of administrative judgment rather than student choice have only reinforced this movement toward uniformity.
>
> "If we genuinely desire diversity we will do all in our power to encourage students to pay for their education through a tax on future earnings. If we genuinely wish diversity, we will insist that such educational grants as are made by the Federal government will be made directly to the student rather than to institutions of higher education.
>
> "Only when there is a free market in education, with the student and his parents able to choose from among schools diverse in kind and quality, will we be able to say honestly to students, 'We do not pretend to supply the sort of education you wish or need. If you really want a totally unstructured, ungraded course of study, segregated, revolutionary, and socially relevant, you can get it at, let us say, Columbia, or Brandeis, or Rutgers, but you can't get it here.' "

"A free market in education" is one of the very few mechanisms for forcing the colleges—the administrators, the faculties, the trustees, the legislators—to pay real attention to the students' real needs. We in the colleges must listen to students and try to decode what they have not found themselves able to articulate. It is not only Mayor Lindsay's list of troubles that we need to hear and to respond to. We must add to the Boy Scout creed—which indeed describes the vast majority of American college students—another list of virtues. Students must be intellectually honest, independent, imaginative, unprejudiced, observant, self-critical, as objective as possible, curious, skeptical to a point, bold as well as courageous, irreverent when necessary, open to novelty, and hard working. With such attributes, real use could be made of learning.

To establish a free market means that the students have the power to decide where they go to school, how long they stay, what and how to study. I believe that they should not be given these choices completely gratis—in the form of scholarships, grants, free tuition, parental support, and such. Partial, yes; total, no. But they should be able to borrow, on their own signatures, in ways which are not terrifying to a provident young person. A loan which is an albatross is not attractive, and should not be. Therefore we need a loan plan that provides mechanisms to spread the risks over large numbers of people, just as insurance policies do.

Fortunately, such a recommendation exists and is non-partisan. It is not tagged with any one person's name, but was independently invented in one form or another by at least six people, mostly economists. A version of it, called the Educational Opportunity Bank, came out of a panel in the Executive Office of the President, a panel organized by President John F. Kennedy. The recommendation of the panel is as follows:

"The Panel recommends establishment of a bank, which might be called the Educational Opportunity Bank (Ed Op Bank), as an agency of the Federal Government. In order to obtain funds, the Bank should be authorized to borrow money at going Government rates. It should be authorized to lend money to postsecondary students, regardless of the student's resources. A student should be able to borrow enough money to cover his tuition, costs, and subsistence at whatever college, university, or other postsecondary institution he is admitted to. The Bank would recoup their loans through annual payments collected in conjunction with the borrower's future income tax. At the time a loan was granted, the borrower would pledge a percentage of his future income for a fixed number of years after graduation. The Panel recommends that the number of years for repayment be 30, or perhaps 40, years. This period would be a fixed term for all borrowers. The percentage of income pledged would be proportional to the amount borrowed. Preliminary estimates are that the Bank could be self-sustaining if it charged borrowers 1% of gross income over 30 years for each $3,000 borrowed.

"This might be considered not a 'loan program' at all, but a device for enabling students to sell participation shares in their future incomes. For purposes of clarity we refer to the proposal as one for 'contingent-repayment loans' and to present programs as 'fixed-repayment loans.' Contingent-repayment loans have three principal advantages to the individual over present fixed-repayment programs:

1. No student borrower would have to worry about a large debt he could not repay. If he entered a low-income calling, or were unsuccessful in a normally affluent one, his obligation to the Bank would decrease proportionately to his income for that period. (Indeed, if a borrower's income fell below a certain level, e.g., because of illness, his obligation for that year might even be completely forgiven.)

We anticipate that this would make students much more willing than they currently are to borrow for higher education. Students from low- and middle-income families would no longer be at a significant financial disadvantage in seeking higher education and would be almost as free as students from wealthy families to choose among the colleges for which they are academically qualified. As a result, the proportion of low-income students attending college might increase appreciably and the proportion able to attend colleges well suited to their needs might increase substantially.

2. By spreading repayment over 30 or 40 years instead of 10, the Bank would make it feasible for individuals to borrow much larger sums than are currently allowed. Estimates suggest that the Bank could break even if it charged borrowers 1 percent of

gross income over 30 years for each $3,000 borrowed. Currently authorized loan programs have a *4-year* maximum of $5,000. Five thousand dollars will not cover subsistence and tuition expenses for 4 years at most residential colleges or at most private commuter colleges.

The Bank would be able to lend enough to cover subsistence and tuition at *any* college. This would currently mean a 4-year maximum loan of at least $15,000, rising in subsequent years. We doubt that many students would choose to borrow this heavily, since this would mean committing about 5 percent of their future earnings. Nonetheless, the option would be available to the poor but ambitious student who wanted to attend an expensive private college but could not obtain adequate scholarship assistance.

3. The availability of loans would not be directly affected by the state of the money market.

"The Bank *could* differ from existing Federal loan programs in another important respect: it could probably be financially self-sustaining. However, the Bank might also be subsidized by the Federal Government in the same way that present loan programs are subsidized. The extent to which the Bank might be used as a channel for Federal subsidies for education could be easily adjusted by Congress at any time. The Bank itself would be both visible and useful whether or not it was subsidized.

"*The Bank is not a substitute for other Federal, State, local, or private programs.* Indeed, it is hoped that these programs would continue to expand."

I believe that the Educational Opportunity Bank has many virtues beyond the primary one of providing loans for which repayment is contingent on the borrower's later ability to pay. But three strike me as having transcending importance.

1. The Bank would make it possible for any student to pay his *own* way, if necessary, at any college, university, or other post-secondary institution to which he could gain admission. At the same time, this proposal does not interfere with support of education by local, State, or Federal Governments. Further, in no way does this program abrogate the right of any future Congress, or force on it the need, to appropriate funds if it does not wish to do so.

2. Large government programs, whether they entail grants, subsidies, scholarships, or other allocations, are most easily administered when there is no need for discrimination among recipients. The proposed program requires no one to decide between the rich and the poor, or among the merits of various cities, States, institutions, etc. It needs no peer-group evaluations, no political pressures, no compromise among the various aspects of civil rights.

3. If this borrowing program became popular and if a substantial portion of higher education were in fact paid for by tuition and subsistence charges, the flexible funds of private foundations might be used in flexible ways for innovation, improvement, research and development, and in the future might result in a better understanding of the processes of learning and of education.

A similar plan, the National Student Loan Bank, appears in a fine form in a report entitled *Toward a Long-Range Plan for Federal Financial Support for Higher Education* which was issued by Wilbur J. Cohen in January of this year.

> "To remedy the deficiencies in the present Federal programs for student loans, the NSLB is proposed. The NSLB would be a *nonprofit private corporation* established by the U.S. Government. The NSLB would issue its own securities to raise capital for student loans and would make loans at *fixed interest rates*. It would replace the guaranteed loan program. The NSLB would have the following features:
>
> "The Bank would lend any eligible undergraduate student or graduate student (or medical, dental, etc.) an amount each year which could not exceed his tuition and living costs minus any Federal aid received. Eligibility would be based solely on enrollment in an institution of higher education and would extend for up to 5 years at the undergraduate level and 5 years at the graduate level.
>
> "The NSLB would devise methods of repayment that allow for various terms extending up to 30 years. Provision would be made for rising repayments over time (in keeping with income) or constant annual payment at the option of the borrower.
>
> "Interest during enrollment would be paid by the Federal Government. Interest charges would be set in such a way that there would be *no* subsidy during the repayment period.
>
> "Federal loans might be repayable through the Internal Revenue System. Even without this feature, the NSLB would probably have relatively lower collection costs than banks do under the present guaranteed loan program.
>
> "The Federal Government would reimburse the Bank for losses due to death, disability, or default, as at present. In addition, a feature might be added which would allow for a limited form of pooling or mutualization of risk. For any year in which a borrower's income falls below certain levels, a portion of the loan payment for that year would be cancelled. This feature could be designed to affect 5–10 percent of the scheduled repayments."

The report of the Carnegie Commission on Higher Education, *Quality and Equality: New Levels of Federal Responsibility for Higher Education*, makes the same recommendation.

> "The Commission recommends that a Federal contingent loan program be created for which all students, regardless of need, would be eligible. With interest figured on the basis of Federal borrowing costs, the program should be self-sustaining, except for administrative costs, which would be met out of appropriations. Undergraduates would be eligible to borrow up to $2,500 per year, and graduate students up to $3,500 per year, for educational purposes. No student should be entitled to receive more in loans, all types of grants, and work-study payments in any year than the costs of education, including subsistence costs, as officially recognized by the institution in which he is enrolled.

"The program would be administered through the institutions of higher education, which will have the relevant information on grants and work-study payments to loan applicants.

"*Level of funding:* A loan program of this sort must be viewed as clearly experimental; it is difficult to predict the extent to which it will be used. But if loans are to be made available to students without reference to need, it will be necessary to have the initial level of funding for the loan program high enough to eliminate any requirements for setting priorities among loan applicants. The Commission suggests that funding be made available to provide student loans totaling $2.5 billion in 1970–71, possibly increasing to as much as $5 billion in new student loans in 1976–77.

"It is also difficult to predict the level of Federal expenditures which would be required by this loan program. Although designed to be self-supporting, the program would require, particularly in the initial years, annual Federal appropriations amounting to perhaps 5 percent of new loans committed that year for administrative costs and contingencies. This would amount to about $125 million in 1970–71, rising to $250 million in 1976–77."

All of these proposals urge equally strongly that we not throw out the baby with the bath water. Clearly, no one method of financing higher education would be either adequate or proper. There is a spectrum of funding which encompasses all levels of dependability. To use jargon, there are various forms of "hard" money and many sources of "soft." This is just as applicable to support direct to the colleges as to support of the students. A contingent loan program must be seen as a portion of that part of college support supplied by the students themselves. I dread to think of the possibility of having all of the power in the hands of the young people. Some rights, sovereignty, duties, and judgments must be left in the hands of the people who, year after year, remain employed by the colleges. It is only they who can effect the changes that are needed. Here, for instance, is a partial list of topics to cope with.

PROBLEMS FACING INSTITUTIONS OF HIGHER LEARNING—COLLEGES & UNIVERSITIES

I. *Finances:*

1. Endowments
2. Costs and prices—tuition—subsistence
3. Income
4. Dependence on government (State and Federal)
5. Dependence on foundations
6. Building ownership versus rent
7. Obsolescence of plant
8. Inflation—deflation
9. Student loans
10. Scholarships
11. Over-commitment

II. *Faculty:*

1. Morale and status
2. Tenure—promotion—position
3. Quality
4. Rejuvenation—sabbatical leave—in-service study
5. Preparation of college teachers
6. Part-time faculty
7. Recruitment—young faculty members—graduate students
8. Selection
9. Freedom
10. Mobility
11. Individual entrepreneurship

III. *Students:*

1. Variety of goals
2. Types and variety of attitudes
3. Independence—non-dependence
4. Guidance:
    don systems
    buddy systems
    family groups
    fraternities
    living groups
5. Morale
6. Sex and the campus
7. Women students
8. Discipline
9. Morals and behavior:
    (a) absolute
    (b) relative
10. Mobility of students about and in many institutions
11. Early marriage and early children
12. Learning styles

IV. *Space, Equipment, and Facilities:*

1. Laboratories
2. Libraries
3. Dormitories and Dining
4. Clinics
5. Large muscle-activity places
6. Theatres
7. Studios
8. No place to sit
9. Individual working spaces
10. Classrooms—seminars
11. Audio-visual aids
12. Computers
13. Museums, displays, and workshops

V. *General Administrative Arrangements:*
  1. Semesters, trimesters, months, and other calendar questions
  2. Admissions mechanisms
  3. Educational mechanisms
  4. Field work
  5. Committees
  6. Registration
  7. Computerization
  8. Scheduling
  9. Courses versus independent or individual work
  10. Grades—ratings
  11. Examinations and quizzes

VI. *Curricula, Subjects, or what goes on in school:*
  1. Math and sciences
  2. Humanities—including drama and the literary arts
  3. Study of people in groups—including anthropology and economics
  4. Study of individual human behavior (personality and emotion)
  5. Music and visual arts
  6. Communications—including scientific study and other including languages (reading, writing, listening, and speaking)
  7. Histories—including archeology
  8. Professions such as law, medicine, journalism, business:
     (a) for professionals
     (b) for non-professionals
     (c) for other-professionals
  9. "Education" and relations with schools
  10. Graduate
  11. Postgraduate

VII. *Activity now called Peripheral, Extra-Curricular, etc.:*
  1. Public service activities:
     (a) military and government (secret, non-secret)
     (b) foreign
  2. Relations with schools
  3. Special attention to vocational education
  4. Relations with communities

VIII. *Governance and the Administrative Bodies:*
  1. Faculty powers
  2. Presidents, deans, etc.
  3. Boards of trustees
  4. Visiting committees
  5. Student role
  6. Alumni
  7. Committee system
  8. Interactions of these groups

IX. *Comparisons between Types of Schools:*
1. Public versus private
2. Small versus large
3. University versus 4-year versus 2-year
4. Professional schools as part of university or not
5. Specialized institutions versus general:
    - (a) "liberal arts" versus scientific and technical
    - (b) military
6. Parochial (in general sense) versus non-parochial:
    - (a) Catholic and other church related
    - (b) Negro

X. *Research:*
1. Learning about learning (learning versus teaching)
2. Relations between research at "graduate" level and undergraduate instruction
3. Research types:
    - (a) "pure" versus applied
    - (b) many-man versus bench-top ("big" science versus "small" science)
    - (c) questionnaire type researches
4. Evaluation of:
    - (a) procedures
    - (b) students
    - (c) faculty
    - (d) curriculum materials

XI. *General Problems and Special Problems:*
1. The waste of college and university administrators in fund raising
2. The non-existence of architects
3. Education of women
4. Education after last graduation:
    - (a) from secondary school
    - (b) from college
    - (c) from professional school
    - (d) from graduate school
5. Preparation of counsellors
6. The crossing of the disciplines:
    - (a) mathematics and the sciences
    - (b) pure and the applied of any discipline
    - (c) science writers
7. Science in the colleges

Surely these cannot be handled by the students. Inputs, yes; comments, yes; final judgments, I think not.

Now where should another major focus be? So many of these reforms are necessary but not sufficient. Let us look at Professor Tonsor's speech again. He says, "It is essential that we have genuine experimentation and not the pseudo experiments hatched by administrators and departmental chairmen who need an excuse for hitting the foundations or the legislators once again for funds." To indicate what this statement implies and to show that some of us in academia believe it—to the point of devoting our professional lives to it—let me quote from a paper about to be distributed to the incoming MIT freshman class.

> "The Education Research Center at MIT has begun a major piece of educational reform. The effort could, we believe, have an impact on many aspects of postsecondary education in the country. This paper is intended to serve as a brief statement of the scope and direction of the program.
>
> "A fraction of the MIT freshman class in September, 1969, will enter an educational program that will question all of the assumptions of form and strategy: credentials, certification, style, scope, topic, pace, technique, and organization—in short, most of the traditional constraints of American higher education.
>
> "We are proposing to blur disciplinary lines, to start with projects constructed around real problems, to engage the issues raised by the organization, structure, and function of physical, chemical, biological, economic, and social systems. We believe this kind of issue can appeal to audiences that vary widely in sophistication, prior training, and vocational or professional aspirations. Indeed, we believe that there are many entry points, many routes through, and many exits from the formal educational experience, and that the choice of entry point, path, and exit point for each student should be a function of his style, interest, and ability and not limited by artificial constraints.
>
> "This structural reform in higher education must be accompanied by a thorough re-examination of the material being taught. We have, therefore, undertaken the development of a number of parallel and interwoven study programs."

One final word. No short collection of proposals for the reform of the colleges and of their students will be enough. The mathematicians' phrase "necessary and sufficient" when modified to "necessary but not sufficient" is appropriate. For our students come in all sizes, shapes, colors, creeds, sexes, states of apathy, liveliness, and self assurance. What we need most is bold leadership with clear ideas and sympathetic governmental support great enough to try experiments large enough to affect the system.

Federal Assistance to Higher Education Through Income Tax Credits

Roger A. Freeman*

INTRODUCTION

At this year's expenditure level of $58.5 billion, education ranks as America's most ebullient growth industry. With only six percent of the world's population and between one-fourth and one-third of its developed resources, the people of the United States are now investing in education almost as much—and possibly as much—as all of the other nations combined. Nothing testifies more eloquently to the American faith in education than the priority which the people have granted it in financial terms: over the past twenty years educational spending multiplied eight times, business and private investment and personal consumption only three times. Allowing for the loss of one-third of the dollar's value over that period, we find that personal consumption slightly more than doubled (+111%) in constant value dollars while educational spending multiplied almost six times (+472%).[1] This magnificent record, which exceeds even the fondest hopes of twenty years ago, disproves slanderous charges that the American people spend lavishly on themselves while treating their schools niggardly.

Higher education has advanced moneywise no less dramatically than education in general; spending by colleges and universities multiplied 8½ times over the 20-year period. Higher education more than tripled its share of the national income and product, pushing it from 0.7% of GNP in 1947/48 to 2.2% in 1967/68.

There are now some signs which suggest that financial needs may not grow as rapidly in the future as they have in the past. Higher educational enrollment is projected to increase only 30% in the next eight years, compared with a 93% jump in the past eight years.[2]

The baby boom of the post war period has now largely been absorbed. A steady and continuing decline in the number of births—which dropped 19% between 1960 and 1968— implies that enrollment pressures will subside and may disappear in the late 1970s and the 1980s. To some extent, however, diminishing births could be offset by further growth in the percentage of our young people who continue their formal education after graduating from high school.

On the other hand, even the tripling of their income during the 1960s appears not to have solved nor even eased the financial problems of colleges and universities. Paradoxically, the situation seems to be growing worse as the institutions' resources multiply at a faster rate. The Association of American Universities (AAU) declared in April 1968 (as it could have done ten or twenty years earlier with greater justification): "The most critical question facing higher education today is how to find sufficient resources."

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[1] Educational data from: USOE, *Digest of Educational Statistics, 1968* and *Statistical Summary of Education, 1947–48*. Economic data from: *Economic Report of the President*, January 1969.

[2] USOE, *Projections of Educational Statistics to 1976–77*, 1968.

Considering the growing wave of campus revolts in recent years, some of us may doubt that finding sufficient resources truly is "the most critical question facing higher education today." Finding leadership capable of coping with the violent uprising could be more crucial.[4] But there is much evidence to support AAU's further statement that higher education faces "a severe and worsening fiscal crisis." Ford Foundation President McGeorge Bundy even referred to an "imminent bankruptcy" of American higher education. With outlays rising faster than established sources of income, and with *planned* outlays exceeding prospective receipts, many colleges are indeed, as Duncan Norton-Taylor expressed it "living with a formula for bankruptcy."[5] If the colleges in *Fortune's* survey—Yale, Cal. Tech, Stanford, Pomona, Dartmouth, *etc.*—the country's wealthiest, are in trouble because donations and tuitions don't grow fast enough, most of the other 1400 odd private colleges must be even worse off. Nor do state institutions have an easy time getting their financial requests approved by governors and legislatures which find budgetary demands from all sides soaring beyond the willingness of their constituents to have their taxes raised. Small wonder the administrators of most IHL have become convinced that only the national government can deliver them from ruin. The national government has in fact responded to the plea in recent years, though not adequately.

GROWTH IN FEDERAL AID TO HIGHER EDUCATION

Federal aid to education came into its own during the 1960s. From $2 billion in 1960, the amount inched to $2.1 billion by 1964, then jumped steeply, reaching $8.5 billion in 1968. The President's Budget for 1971 proposes $9.4 billion to be disbursed through well over 100 programs of grants and loans, most of them of recent origin. But there still is no program of *general* support of IHL, just as there is none for elementary and secondary schools.

Federal funds for higher education totalled $4.4 billion in 1969 and are estimated at $5 billion in the President's Budget for 1970 as follows:

	Million
Research	$1,530
Facilities and equipment	974
Student aid	1,935
Teacher training	92
Current operations	528
Total	[6] 5,000

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[4] Could the preoccupation of university authorities with the procurement of greater resources be somehow related to their inability to meet the challenge of campus unrest?

[5] Duncan Norton-Taylor "Private Colleges: A Question of Survival," *Fortune*, October 1967.

[6] Special Analyses, Budget of the United States, Fiscal Year 1970, Part [illegible]

Aid to current operations consists mostly of support for medical and other graduate education, ROTC activities and for several other specified purposes. Only an insignificant fraction of the Federal funds is available for undergraduate instruction which used to be regarded as the colleges' primary task. Regular faculty and staff salaries and operating expenses (not including organized research) are still the biggest item in college budgets. They total over $10 billion a year nationally, are usually the hardest objective to raise funds for but receive almost no federal support.

This may explain why unmet needs and demands in higher education seem to increase rather than diminish as federal funds multiply: the government has been feeding cake to a man who is not hungry but dying from thirst and begging for water.

WHY IS THERE NO GENERAL FEDERAL SUPPORT OF HIGHER EDUCATION?

It is not because institutional spokesmen have not asked for it repeatedly. The chairman of President Kennedy's Task Force on Education, *President Frederick L. Hovde of Purdue University*, told the House Education Committee in 1961 that "the highest priority need of colleges and universities, both public and private, is for general support and particularly for faculty salaries." Similar pleas were made many times before and after. But no President ever recommended general grants for higher education nor did Congress ever consider such a plan. Educational administrators, however, did not change their tune: At a joint press conference in Washington, November 12, 1968, representatives of the nation's seven major higher education organizations declared that "*general* Federal financial support of colleges and universities is higher education's No. 1 unmet need." (emphasis supplied).

Why does the National Government appropriate no funds for the broad purposes of IHL, as the States are doing, to the extent of about $5 billion a year at the present time? For one, because Congress is always reluctant to make money available to anybody except welfare recipients without specifying in considerable detail how it is to be expended and without having the spending closely controlled by a federal agency. Restrictions and controls accompanying federal funds for research and other purposes have long been a thorn in the side of educational administrators. When faced with a choice between money with controls or no money, however, they opt for the former.

A more difficult, and seemingly insuperable, obstacle to general support is the controversy over the interpretation of the First Amendment clause prohibiting the establishment of religion.

State appropriations go only to the 1037 IHL under (state or local) governmental control, not, with a few minor exceptions, to the other 1500 colleges and universities which are under private auspices.

This has already resulted in a growing imbalance between public and private IHL in enrollment, tuition, salaries, etc. To exclude private colleges and universities from a new and major Federal support program would sound the death knell for many or most of them within a few years.

About 900 of the private IHL are church-connected: 500 are Protestant, 381 Catholic and the remainder sponsored by other denominations. To include them in a general Federal aid program would violate deeply held beliefs of a large segment of the American people about the separation of church and state. Such a program would also probably not survive a Supreme Court test. But to deny those institutions the Federal benefits would face most of them with the alternative of either severing their religious ties and turning secular or withering until they are forced to close their doors. To declare private colleges ineligible as long as they maintain their religious connections would be tantamount to offering them an incentive premium for cutting their church ties and come close to imposing a penalty on the free exercise of religion.

This conflict of conscience divides the American public and neither side is able to compromise on principles held as dearly as freedom of religion and equal justice on one side and the "wall of separation" on the other.

Numerous and extended efforts to enact a program of general Federal support, for the elementary-secondary schools or for higher education, have consistently failed, for several decades, and the prospects of an acceptable solution look no more promising today than they ever did.

The forces backing church-connected IHL may not be able to have a program adopted to their liking. But they have been able to prevent a bill from passing which they believe would irremediably harm their institutions and discriminate against their faithful.

Some members of Congress will not vote for Federal aid to higher education if it *includes* private IHL and some won't vote for it if it *excludes* them. Because of this impasse only programs which are closely circumscribed, often minor or peripheral, have been able to find approval. No plan of *direct* institutional support appears possible for as far as we can see ahead.

However, *indirect* aid could be provided by helping those who now support higher education to finance it more adequately.

INDIRECT AID TO HIGHER EDUCATION

The three major non-federal sources for IHL are: states, students and donors. To aid states would solve little because they are blocked from subsidizing denominational IHL by the First Amendment and the Supreme Court as effectively as the national government. But students and their parents and donors can be assisted in financing the institutions more generously through a method which has found strong support among the public and in both political parties: Federal income tax credits for tuitions and gifts.

In sponsoring an educational tax credit proposal which I had presented to the Senate Labor and Public Welfare Committee ten days earlier, former Vice President Hubert H. Humphrey (then Assistant Senate Majority Leader) explained on the floor of the Senate:

> While this tax credit proposal would not solve all the financial problems related to higher education, it would represent a signifi-

> cant contribution well within our national means. It would provide this assistance in a manner that avoids any argument about federal control of education and also the nagging question of church-state relations. Moreover, it would provide this aid without having to expand the Federal bureaucracy to administer the program.
>
> Support in the Congress has been growing for this general approach to the problem of federal aid to higher education. I know the appropriate committees in both Houses are giving these proposals careful scrutiny and consideration. I hope that the Administration will consider seriously reqeusting such legislation from the Congress.[6]

There is ample evidence that the vast majority of the American people favors the tax credit approach. A national survey by the Opinion Research Corporation of Princeton, New Jersey, conducted for CBS–TV in 1966, disclosed that 70% of the public favors and 13% opposes educational tax credits. The highest support was found among persons in the $5,000 to $6,999 income bracket (88%) and among young people, between 18 and 29 years of age (80%).[7]

A nationwide questionnaire by *Better Homes and Gardens* (June 1968) showed that "almost three-fourths of these 300,000 consumers told us they think a family's college expenses are so basic that they should be deductible on individual Federal income tax returns." Numerous other polls have shown substantially similar results: support of educational tax credits by between 70% and 80% of the public. A questionnaire to the presidents and trustees of all public and private IHL by the Citizens National Committee on Higher Education brought a favorable reply from 90% of the respondents. Only one group showed a slight majority in opposition: the presidents—but not the trustees—of state universities and colleges. They believe that only government-owned, i.e., public, institutions should be aided by government.

PRESENT FEDERAL AID TO HIGHER EDUCATION

Before going into the details of educational tax credit plans I would like to discuss the virtues and the shortcomings of some of the major existing and proposed Federal programs in higher education.

Research funds have helped to advance academic knowledge, particularly in the natural and life sciences where they are concentrated, and have enabled some universities to add eminent scholars to their faculty at very respectable salaries—usually by hiring them away from less favored colleges. They have assisted in important tasks of the national government. But they have not aided the recipient IHL financially and should no more be labelled aid to education than the purchase of research from industrial or other organizations is called Federal aid.

A serious aspect of the Federal research grants is their concentration among a small number of big universities: more than 90% of the money goes to 5% of all IHL which leaves the remaining 95% of institutions relatively poorer off than they were before.[8] This has led to a "brain drain" from the medium and smaller institutions to the big, to an undue concentration of talent in a few places. It is making "the rich richer and the poor poorer," encourages a "flight from teaching," and causes grave imbalances and innumerable administrative difficulties within institutions and between the universities and federal departments.

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[6] *Congressional Record*, June 6, 1963, p. 9677.
[7] *Congressional Record*, April 26, 1966, p. 8821.

Several congressional committees have investigated the problem in recent years and had some harsh words to say about the detrimental effect of the present system of allocating Federal research grants, in unbalancing the program of the small number of recipient institutions and weakening the overwhelming majority of American colleges. But they were no more able to agree on a politically feasible alternative than the academic community.

Scientists and university administrators complain bitterly about the obnoxious restrictions and controls to which Federal research grants subject them. But having partaken of the sweet taste of Federal cash they are no longer able to resist its lure, no matter what the price. They did voice dismay when research funds were cut late in 1968.

Only 13% of Federal outlays for research and development are channeled to IHL and that share is not likely to increase significantly in the next few years.

Construction grants and loans, initiated in 1963 and expanded in 1965, have proven helpful to IHL. They assist hundreds of institutions in building needed classrooms, libraries, laboratories, etc. But they offer no relief on current finances. Quite the contrary. The completion of each new building adds materially to the cost of operations and the need for general revenue. IHL almost never use current income for major construction purposes: public IHL depend for building funds on earmarked state appropriations and proceeds of state bond issues while private IHL rely on earmarked donations.

Moreover, with the enrollment curve flattening out, expansion of facilities should become less urgent as time goes on. In any case, construction seldom presents as pressing or difficult a financial problem as faculty salaries because building funds are usually easier to obtain than unspecified general revenues. This is why IHL do not borrow to finance academic buildings, in contrast to private business and individuals who commonly raise funds for major capital outlays through long term loans. It is not that IHL could not sell their bonds but they have for many years entered the money market as investors rather than as borrowers (except for "self-financed" residence and dining halls). Their reason: future principal retirement and interest would cut into current revenues and restrict general operating funds. College administrators and trustees are far more concerned about strengthening current fund income needed to pay faculty and other salaries than about construction money. They can have a great university in ancient or mediocre buildings—but not with a mediocre faculty. Whether we like it or not, the level of income that IHL are able to offer is a major—and possibly *the* major—factor in influencing the decisions of many of our most talented young men and women to choose an academic career rather than some other professional or business vocation. There is a positive correlation between faculty salaries and the caliber of professors in years to come. Buildings can be completed in two years or less but it takes close to a generation to build an eminent faculty. But, as I mentioned earlier, almost no Federal aid is available to pay the salaries of faculty in undergraduate instruction.

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[8] Those rates of concentration were somewhat reduced in the past few years.

Student aid, at $1.8 billion in 1969, is an important item. Much of it is earmarked for graduate fellowships and training in a few specified professions, most of the rest for NDEA and guaranteed loans, veterans benefits, work-study, leaving about $130 million for the only program that might be called scholarships: educational opportunity grants to students with "exceptional financial needs." Fewer than 5% of all undergraduates participate in that program. Most students who need assistance are helped by loans, work-study and by scholarships available from private or state sources.

THE TUITION PROBLEM

The cost of attending IHL has been going up steadily though not as fast in public IHL as prices and more slowly than income in both public and private IHL:

	Tuitions and fees		Total cost (including room and board)		Consumer prices	Personal income per capita[1]
	Public	Private	Public	Private		
1958–59	$224	$967	$932	$1,687	101.1	$2,068
1968–69	$299	$1,380	$1,092	$2,326	124.2	$3,421
Increase (percent)	+34	+59	+17	+38	+23	+65
Projected, 1978–79 (1967–68)	$375	$1,906	$1,264	$2,988		
Increase (percent)	+25	+38	+16	+29		

[1] Calendar years 1958 and 1968.

Source: Department of HEW, *The Chronicle of Higher Education*, Oct. 28, 1968.

If income has been growing faster than the cost of attending college, why do many families have so much trouble financing their children's education? Because more of their children attend. College enrollment equalled 15% of the 18 to 21-year old population in 1940 and now runs at 48%, headed still higher. A family that formerly counted itself fortunate if it managed to put one son through college will now try to enable several or all of its children to acquire a higher education. And it must do so if those young men and women are later on to fill any but manual jobs. The impact on average family finances has thus become much harder, and in some cases disastrous.

At a cost of four years of undergraduate education between $10,000 and $20,000 *for each child*, higher education may cost more than the family home. It can be a far heavier burden than mortgage interest, state and local taxes, medical expenses or casualty losses—for which the tax law grants relief. Nonrecognition of college costs for tax purposes adds to the burden of higher education. It may have been justified in days when attendance was the privilege of a small well-to-do minority, but today it constitutes a grave injustice.

Sending its children to college of course imposes no financial hardship on a wealthy family. Nor is attendance an insuperable task for a student from a low-income family who, if otherwise qualified (and often even if he is not), is eligible for a scholarship, Federal, State or private.

But students from a middle-income background and their families can frequently raise the required funds only with great difficulty; they may be ineligible for Federal and other scholarships. Though they account for the majority of the student body at most institutions, they are hit the hardest by the inadequacies of the present system. Somehow, they seem to fall between two stools. An official study at the University of California at Berkeley in 1967 (conducted by David Bradwell & Associates) found that students from middle-income families are financially worse off than those from poor backgrounds.

Public IHL have been raising tuitions much more slowly than private IHL. They derive only between 10% and 20% of their income from fees because their requirements are met mostly by state appropriations. Private IHL have no such recourse and must cover the difference between their costs and donations largely from tuitions. Consequently the "tuition gap" has been widening. While the tuition ratio between public and private IHL used to fluctuate around 1:3 until the early 1950's, it now stands at 1:4.6 and is likely to exceed 1:5 within a few years.

The widening tuition gap has had many detrimental results. Enrollment which for many decades used to be divided about 50:50 between public and private IHL has since 1951 been shifting toward public IHL which now accommodate 70% of all students. About three of every four new students now enroll in a public IHL. If the tuition gap continues to grow, public IHL will, in the late 1970s, account for 80% or more of the student body. This is of course a very expensive proposition for the taxpayers who are shouldered with 80% to 90% of the cost of educating the students at public IHL. Moreover, if present trends continue, the situation in higher education several years hence will resemble the picture in the lower schools where the public schools account for 85% of the enrollment and enjoy a virtual monopoly in many areas, particularly in regard to children from families which are less than affluent.

The growing tuition gap prevents private IHL from raising their tuitions to a level sufficient to meet their needs. A few years ago Chancellor Lawrence A. Kimpton of the University of Chicago told an audience of state college administrators: "To put it in the crassest terms possible—and I know this will offend many of the brotherhood—it is hard to market a product at a fair price when down the street someone is giving it away."

Why should students at IHL pay only 10% or 20% of the cost of their education? Why should they place most of the burden on the general taxpayer when they will, as a result of their education, earn a much higher income throughout their working lives? Would it not be preferable to charge higher fees to all students and reserve part of the greater revenues to increase the number and amount of scholarships for students from low-income families? Most students at public IHL now spend much more for alcohol and cigarettes, not to mention automobiles, than on tuition to pay for their education.

Does it not give a student a completely wrong set of values if a college charges him full cost for room and board but only a small amount for his education? Would it not be preferable, *ceteris paribus*, to give him a discount (or even a waiver) on his board and room but charge him closer to full fare for his education?

In its 1956/57 annual report the Carnegie Foundation for the Advancement of Teaching suggested: "Private institutions may eventually have to charge the full cost of education in tuition. They can then go even further than they have to date in providing various forms of scholarship aid for those students who need it."

As long as public IHL keep their tuitions at a small fraction of cost, few private IHL can afford to follow that advice.

Private colleges pay their professors on the average about $1,000 less than state colleges,[9] and levels of compensation are likely to be reflected, sooner or later, in the caliber of the faculty. This will place private colleges in a precarious position. Who would want to pay five times as high a tuition to send his son or daughter to an inferior college?

These problems could be solved if public IHL were to raise their tuitions substantially while expanding their student aid funds. That would still give them large additional revenues for their general purposes. In turn this would make it easier for private colleges to boost their tuitions.

Would this not drive the cost of education beyond the capacity of a large number or most families? It might—unless government aided with the payment of the increased fees. Such aid could be provided, for example, in the form of broad-scaled ample scholarships or through a system of government vouchers which the students would give to their institutions, to be cashed by them.

Vouchers for college students would enable the institutions, public and private, to charge considerably higher fees without burdening the students or their families; the added revenues could be spent by each college for whatever it needs most.

While such a plan would overcome some of the shortcomings of the present system, it could be subject to constitutional challenge as litigation and several decisions on similar state or local plans in recent years suggest.

The only method of aiding students, and indirectly institutions, that is completely safe from constitutional challenge is tax credits: no money would flow from the national government either to an institution or a student. Individual taxpayers would *reduce* their payments to the government. Tax deductions for many purposes, including church support, have always been an integral part of our tax system and have as such never been questioned on constitutional grounds. Nor is it conceivable that they could.

Before discussing the various aspects of educational tax credits we probably should survey some of the major alternatives suggested by educational organizations.

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[9] The situation is, however, reversed in universities.

RECENT PROPOSALS FOR EXPANSION OF FEDERAL AID TO HIGHER EDUCATION

Some of the leading organizations in higher education have within the past year submitted plans for expanded Federal aid.

The National Association of State Universities and Land-Grant Colleges and the American Association of State Colleges and Universities have asked for more generous grants and loans for construction purposes and "operating support for all accredited institutions that can participate. . . ."

The clause "that can participate" is a more sophisticated way of saying what used to be expressed in plain language until a few years ago: that private institutions, but most decidedly church-connected colleges, should not be eligible. In other words, that only public IHL should receive broad Federal support on an institutional basis. The associations approve of graduate fellowships and traineeships but "continue to oppose a general federal scholarship program in the absence of evidence that it would in fact assure college attendance for a substantial number of the highly talented who cannot now attend under existing public and private programs. . . ."

The two associations oppose tax relief for tuitions and fees and also object to an expanded student loan program with long terms of repayment (Educational Opportunity Bank) because it would require a student to "indenture" himself for most of his working life.

The Association of American Universities (AAU) advocates direct general-purpose institutional grants to all public and private IHL which meet recognized standards. How such grants to church-connected institutions could be protected from constitutional challenge the association fails to explain.

In the early 1950s, shortly after a presidential commission had recommended federal grants for operation and construction at public IHL, AAU sponsored a Commission on Financing Higher Education which after laboring for three years declared: "This Commission has reached the unanimous conclusion that we, as a nation, should call a halt at this time to the introduction of new programs of direct federal aid to colleges and universities." The Commission's Executive Director wrote as late as 1963 that "the conclusions of the Commission on Financing Higher Education have not been outdated either by events or by further analysis." [10] But as of 1968 the AAU recommended besides the mentioned institutional grants, expansion of federal scholarships and fellowships, student loans, facility, research and other categorical aid.

In a special report to the Carnegie Foundation for the Advancement of Teaching in December 1968, its Commission on Higher Education, chaired by former University of California President Clark Kerr, recommended for Federal action: a major expansion of scholarships, fellowships, work study, student loans with greatly lengthened terms of repayment, enlarged support of research and construction and of other categories such as medical education, libraries, international studies, developing institutions, etc. To supplement inadequate tuitions, the Commission suggests "cost of education supplements" paid directly to institutions. The question is not even mentioned how such payments should be made to church-connected institutions.

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[10] *Educational Record*, 1963.

While the three groups agree in their demands for more Federal money and on more generous construction grants they disagree on almost everything else, although some dissents are covered up. In regard to general purpose aid the State IHL want it for themselves while the other two groups do not refer to the trap that has killed all such proposals in the past: aid to denominational IHL. Some of the institutional heads may hope to persuade Congress to enact a general aid program and from which institutions with church connections would then be dropped either during the legislative process or subsequently by judicial action.

Does this help to "reduce the rising tide of conflict between the [public and private] institutions," as Clark Kerr suggested?[11] Quite the contrary; it is apt to aggravate and perpetuate it.

Would Congress and the American public face the disappearance of many or most of the 900 church-connected colleges and universities with the same equanimity and unconcern as the administrators of state universities? Not very likely.

Many who are convinced that the financial problem in higher education cannot be solved without massive Federal aid might be willing to accept such an outcome if there were no alternative available. But there *is* an alternative—to permit Federal income tax credit for tuitions and other expenses and for donations to higher education.

TAX CREDITS FOR TUITIONS AND OTHER EXPENSES IN HIGHER EDUCATION

Soon after the Commission on Financing Higher Education in 1952 recommended against the introduction of new programs of *direct* Federal aid to higher education, the American Council on Education, the American Alumni Council, and other groups sponsored plans for helping higher education by *indirect* means, through tax relief for tuitions. But the methods proposed—income tax deduction, additional exemptions or flat percentage credits—would have conferred most of the benefits to higher income brackets and to private IHL. Several hundred bills on tax aid to higher education were introduced but none brought congressional action because of the inequities involved.

Disappointed by their failure, educational organizations in the early 1960s shifted their efforts toward securing direct grants. Bills for construction and student aid and various other purposes were enacted but no plan for institutional support was considered by Congress.

In 1963 when I was asked by the Senate Labor and Welfare Committee to testify on President Kennedy's recommendations for Federal aid to education I conceived of a method of aiding higher education that allocated the benefits more fairly: Federal income tax credits for tuitions and other educational expenses on a graduated or sliding scale. I testified and submitted the plan on May 27, 1963.[12] Ten days later the then assistant majority leader Senator Hubert H. Humphrey announced on the floor of the Senate that he had introduced a bill to implement the plan as a "sensible and workable system of Federal assistance."

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[11] Clark Kerr, "The Distribution of Money and Power," *The Public Interest*, Spring 1968.

> It is essential that an across-the-board tax credit program be initiated to assist every person currently facing the considerable expenses associated with higher education. . . .
>
> I have sponsored similar tax credit legislation for many years. However, the bill I introduce today is, in my opinion, a significantly improved measure over all earlier versions.
>
> Tax deductible, additional exemption, and tax credit bills share a common purpose: first, to assist persons financing a college education and second to provide indirect assistance to the institutions of higher education.[13]

Senator Humphrey then cited from my testimony before the Senate Committee on May 27 and continued:

> The sliding tax credit schedule provides a sensible and workable system of Federal assistance that helps every student, indirectly helps both public and private institutions, and does so in a manner that in no way interferes with individual or institutional freedom or policies. This bill, providing for a declining tax credit for expenditures on tuition, fees, books, and supplies mitigates the distortion found in the large majority of bills that rely on tax deductions, additional exemptions, or non-variable tax credit. . . .

The graduated percentage tax credit plan rapidly gained sponsors in both political parties and soon commanded majority support in the Senate. During a debate on November 21, 1963, Senator Keating said:

> Perhaps the bill could properly be called the Ribicoff-Keating-Humphrey-Goldwater bill. Having said that, I should say that it ought to have widespread support in the Senate, if four Senators of different philosophies have stated their adherence to the sliding scale principle. We can, therefore, look forward to big things for this amendment.[14]

The plan came up for congressional action three times and commanded a clear majority on each occasion. But it was not enacted when "the Johnson Administration used every ounce of influence it could muster" and "snapped the whip and lashed Senators in line against the proposal" (citing reports from *U.S. News and World Report* of February 14, 1964, and the *Washington Star* of March 14, 1966). Key legislators were told by Presidential Assistant W. Marvin Watson "that 'they were through' at the White House if they backed the Ribicoff plan." Mr. Watson ". . . emphasized that he was speaking for the President who . . . was prepared to deal them out of all Federal patronage and projects of 'you cross him on this vote.'" (*The New York Herald Tribune*, March 10, 1966) Even some of the bill's sponsors were forced to reverse themselves and vote against it at Senate votes in February 1964 and March 1966 so that the plan could be defeated by a narrow margin. In 1967 the educational tax credit bill was sponsored by 47 Senators of both political parties and on April 14 of that year the Senate adopted the plan with a vote of 53:26. But again President Johnson succeeded subsequently in preventing enactment.[15]

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[12] *Education Legislation—1963*, Hearings of the Subcommittee on Education of the Committee on Labor and Public Welfare, U.S. Senate, 88th Congress, 1st Session, 1963, pp. 1265 ff. *Congressional Record*, May 27, 1963, pp. [illegible] ff.

[13] *Congressional Record*, June 6, 1963, p. [illegible].

[14] *Congressional Record*, November 21, 1963, p. [illegible].

WHAT WOULD TUITION TAX CREDITS DO?

The Ribicoff-Dominick plan—so named after its leading sponsors Senators Abraham Ribicoff and Peter Dominick—would permit anybody who pays for tuitions, fees, books and supplies for a student at an IHL (whether the payer be the student himself, his parents or a benefactor) a credit against his income tax liability, as follows: 75% of the first $200, 25% of the next $300 and 10% of the next $1,000. This [illegible] penses of $1500 a credit of $325 (22%). The credit starts tapering off from an income of $25,000 on and vanishes at $57,500.

The Treasury Department estimated in 1968 that the Ribicoff-Dominick plan would cost $750 million a year, gradually rising to $1.3 billion, and that 62% of the credits would accrue to beneficiaries with an income between $3,000 and $15,000, 91% to persons with an income under $25,000.[16]

The claim was raised by the State universities that educational tax credits would "help those who need it the least." This is simply not true and sounds particularly strange coming from an organization which for many years has steadfastly opposed the expansion of Federal scholarship programs. Most of the benefits of the tax credit plan would accrue to lower-middle and middle-income families which suffer more heavily from the burden of sending their offspring through college than any other economic group.

In other words, the tax credit plan offers little or nothing to the rich, little or nothing to the poor and aims at easing the future college burden of the vast majority of students who come from families "in between." Students from families with so low an income that they pay no or little income tax probably account for less than 10% of the enrollment. Most of them, as I mentioned earlier, are probably on a scholarship of one type or another.[17]

Senator Ribicoff explained:

> We must face squarely the need to provide tax relief to ease the heavy burden of college costs. It has been discussed for over a decade. Now we must decide if, as a nation, we are to treat education's costs as we do the interest on a home mortgage, or flood damage, or health expenses.
>
> This proposal is for the average family in America. It is for the people who constitute the backbone of America—the blue col-

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[15] A more extensive description of the Congressional proceedings is contained in my book [illegible]

[16] Congressional Record, [illegible]

[17] [illegible] scholarships.

lar workers, the white collar workers, the wage earners, and salaried persons of the lower-and-middle-income group who are struggling to pay their bills, buy their homes, and educate their children. They work hard for their wages or salary—and it is all taxable.

Our income tax is a graduated tax. It is based on ability to pay. If they pay a $1,000 medical bill, they get some tax relief. If a tornado or flood causes them $1,000 of damage, they get tax relief. But if they pay $1,000 a year for 4 years to send their sons and daughters to college, they bear that burden with no help from our tax laws.

Senator Dominick defined the aim of the plan: to enable a student's family to use its pre-tax earnings to pay for his college education.

The granting of tuition tax credits would not only free more scholarships for students from a low income background, it would also stimulate thousands of potential donors to offer scholarships to needy students for which they would receive credits on their income tax.

WHAT ARE THE OBJECTIONS TO EDUCATIONAL TAX CREDITS?

Some have declared tuition tax credits to be unfair because they would provide no direct benefits to persons who pay no income tax. That is like saying that for example the 1954 income tax deduction was unfair because persons whose income is so low that they are not taxable did not benefit from its use; or that personal exemptions and deductions are unfair to persons whose income is wholly derived from social security, unemployment compensation or public assistance because they cannot take advantage of them.

If, however, it were felt desirable to make direct benefits available to persons who pay no income tax, the tax credits could be made refundable, as I suggested to the Senate Labor and Public Welfare and Finance Committees in 1965: a potential recipient would compute his income tax including his tuition tax credit and if his return winds up with a final net credit it would be paid to him, the way other net credits on an income tax return.

Some have even claimed that tuition tax credits would be unfair to persons who have no college expenses. That is like saying that deductions for medical expenses, casualty losses or state taxes are unfair to persons who incur no such outlays, or that granting exemptions for dependents is unfair to persons who have no dependents. I do not believe that such contrived and specious arguments deserve to be taken seriously.

You may have noted that I referred to benefits to students and their parents while earlier I was talking about helping the institutions. Opponents to educational tax credits have criticized the sup-

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[illegible]

[illegible]

[illegible]

gestion that both, institutions and students, would be benefited. Obviously, they say, it can be only one or the other.

But this is a misunderstanding. IHL have been steadily boosting their tuitions and if they continue to do—as they most certainly will—tax credits will enable them to receive substantial additional revenue without imposing a commensurate burden on their students. A significant share of the tuition increase will be borne by the Treasury and not by the students. Thus the benefits will in all likelihood be split between students and institutions. It is entirely irrelevant what the proportion will be. As long as a substantial part of the support of higher education is derived from fees, it is immaterial for the benefit question at what point in the stream the funds are added.

The Association of State Universities and Land Grant Colleges wrote in a circular letter dated February 17, [illegible]:

> While the plan has been "sold" to many parents as a means of getting financial relief from the Federal treasury for the cost of sending children to college, it was in origin and is in its primary intent, a plan to siphon off substantial amounts from the Federal treasury for support of colleges and universities.

Opponents in the [illegible] and [illegible] debates quoted repeatedly from my statements to the two Senate committees in [illegible] in order to prove that what I really intended to do was to help institutions more than parents. I may as well admit that I do not regard the aim to aid colleges and universities at this point in time to be of a sinister nature nor a nefarious plot which needs to be concealed. I see nothing wrong with helping students and their families support the college of their choice. Aid to parents and to institutions are simply two sides of a coin which cannot be divided though some pretend that the one side they are looking at is the whole coin. It seems to me that the charge that a plan would "siphon off substantial amounts from the Federal treasury for the support of colleges and universities" comes in particular ill grace from groups which have long been leading a campaign to channel large Federal funds into higher education—provided that their member institutions and no others were the only beneficiaries.

Nobody has ever seriously asked whether the tax law permits the deduction of gifts for educational, charitable and religious activities because it tends to aid the donor or the activity. We take it for granted that it is the intent of the provision to help the giver give, to motivate and enable him to give more for a cause that is held to be in the public interest. Similarly, tuition tax credits are not intended to help the taxpayer as such but to help him support the college of his choice.

It is significant that the cost of tax credits and their impact on the U.S. budget deficit are being quoted as an argument by groups which advocate sharply increased Federal spending for programs in which they have a stake. The budget deficit, it seems, is of concern only when it is occasioned by a reduction in revenues through tax credits, but irrelevant to the extent to which it is caused by direct Federal appropriations.

Opponents say that institutions could benefit from tax credits only if they boosted tuitions and that higher tuitions would create barriers for students from low-income backgrounds who would receive no benefits from the credits. The fact is of course that tuitions have been climbing steadily and will certainly continue to do so. The U.S. Office of Education prepared a projection—assuredly not based on the possible approval of tax credits—according to which average tuitions will rise from $1,260 in 1968/69 to $1,906 in 1978/79 at private IHL. Many families will find some of these boosts hard to bear unless they are granted relief in some form.

It is frivolous and nearly slanderous to charge—as some have—that boards of trustees would boost tuitions simply for the purpose of raiding the treasury, if income tax credits were made available. Boards approve tuition increases only when the financial needs of the institutions demand it—and often not even then. The question is whether students will have to bear the whole impact or only part of it. It is obvious that students from low income backgrounds can be protected by being given a reduction or exemption from tuition boosts.

Some object to tax credits because they would open another loophole in the Internal Revenue Code. This would indeed be a valid argument if the federal income tax were otherwise comprehensive. The fact is, however, that in 1968 less than half of all personal income was taxable. Out of $687 billion personal income, $361 billion escaped taxation through deductions, exemptions, exclusions and credits to benefit literally hundreds of activities or to ease special burdens. Why should education be discriminated against and forever remain a stepchild of the tax code? Until at least a substantial share of the missing $361 billion is subjected to taxation it does not seem fair to single out education for the rough treatment while granting numerous other activities a favored status. To worry about endangering the integrity of our income tax through educational tax credits is like being concerned about imperiling the virtue of a prostitute by letting her read a sexy book.

President Charles Cole of Amherst College once made a cogent comment on the fairness of tuition tax credits: "Tax payments to the state which finance public universities are deductible from income reported for Federal taxes, but if the payment for education is made to a private institution, no tax allowance is to be had." [1]

Investment credits, authorized in 1962 at President Kennedy's recommendation, proved to be a very effective stimulant for plant expansion and job creation. Similarly, tax credits could turn out to be a very profitable investment for the taxpayers. If such credits were granted and some students thereby enabled to attend a private IHL—while without the credit they could not afford to enroll at any but a low-tuition public IHL—the taxpayers would save $2,000 a year or more for a concession which is limited to $325 under the Ribicoff-Dominick Plan.

That plan is heavily slanted in favor of low tuition public institutions. A student who pays a tuition of $300 (the 1968/69 average) at a public IHL would have 80% of his payment wiped out by the credit; a student at an average private IHL (1968/69 tuition $1,260) would only get a credit equal to 26% of his cost. Differently: the credit of the student at the private IHL would be $100 higher—but his additional fees would amount to $1,000, or eight times as much.

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[1] Higher Education in the United States: The Economic Problems, Seymour E. Harris, ed., Harvard University Press, 1960, p. 77.

One argument sometimes used against tax credits appears to be fact-based: tax credits would not enable the national government to increase its influence on the policies and practices of IHL while added programs of direct grants-in-aid to institutions would significantly strengthen the supervision and control which Federal Departments already exercise through some of the existing programs. Whether greater control of education by the central government is desirable or not is a question of political philosophy.

It is not surprising that the Association of American Colleges in 1964 with an overwhelming vote decided to endorse tax credits in higher education. President Nixon has also advocated educational tax credits during the presidential campaign, in keeping with the Republican platform adopted in August 1968.

Another form of tax credits can be at least as beneficial to IHL as tuition credits: credits for donations.

FEDERAL INCOME TAX CREDITS FOR DONATIONS TO HIGHER EDUCATION

Donations to higher education are highly concentrated in two ways:

(a) The bulk of the gifts goes to well-known prestige institutions with the crumbs left for the others;

(b) Most of the total amount of gifts from individuals comes from wealthy persons and families. Small contributors account for only a small share of the aggregate.

This is probably inevitable under our present federal tax laws. The Internal Revenue Code permits an individual to donate to higher education, and to deduct from his income for tax purposes, up to 30% of his income, a corporation up to 5% of its profits. But most taxpayers give nothing to higher education and those who donate give only a small fraction of their allowable contribution except a few persons in the highest income brackets. Under our progressive income tax scale, with rates ranging from 14% to 70%, high-income persons can shift up to 70% of the cost of their gift to the U.S. Treasury. Moreover, by donating property which has gained in value over the years, they can avoid paying a capital gains tax. So their gift may in the end cost them little if anything.

But taxpayers in the lower brackets find that up to 86% of their donation comes from their own pockets. And since it is so much more expensive for them to donate, not many of them do. Only a small fraction of the ten million college graduates and of another ten million persons who attended college for from one to three years are regular contributors to their alma mater or to any other college—although they paid only part of the cost of their education while they attended and most derive substantial material benefits from the education they received or the degree they were given.

The undesirable consequences of the high concentration of voluntary giving—from a few wealthy individuals and families and to some colleges—are too obvious to require much explanation. It is much healthier for a college to get 10,000 contributions of $100 each, and get them on an annually recurring basis, than to receive a $1 million gift from a rich individual.

Voluntary support of higher education could be placed on a far broader foundation, with millions of new contributors making regular annual donations by a change in the tax law which has been repeatedly suggested in recent years but not yet been approved by Congress: to permit deduction of a donation from the income tax itself rather than merely from the tax base (adjusted gross income). A proposal to permit a 100% tax credit (i.e. a direct offset against tax liability) up to $100 to individuals and $1,000 to corporations was submitted to the Senate Labor and Public Welfare Committee on May 16, 1965, by President John A. Howard of Rockford College and President Landrum Bolling of Earlham College on behalf of an ad hoc committee of college and university presidents. Several bills to implement the plan were introduced in the 89th and succeeding Congresses but no further action has so far been taken.

If a donation up to a ceiling of $100 (or preferably a somewhat larger amount) were deductible from the Federal income tax liability itself it would give taxpayers the choice of sending $100 to the federal tax collector or to a college. This would cause millions of alumni and others to make regular annual donations to higher education and large amounts of new money would flow to the colleges, public and private, for general operating purposes and for scholarships. Small colleges would then more equitably participate in the gifts and the existing imbalance would gradually be reduced. Federal income tax credits for donations to institutions of higher learning could well become the most significant advance in college finance and would help save many institutions which otherwise might not be able to survive.

CONCLUSION

The urgency of current pleas for congressional authorization of sharply increased funds for IHE, reflects a spreading fear that the institutions may shortly face a grave financial crisis. There are good reasons for this fear, although they are not necessarily the reasons most frequently cited by petitioners for funds. The mass riots, violence and wanton destruction that have occurred on college campuses across the nation, the forcible disruption of studies and of orderly administration that have been permitted to take place and to continue at institutions, large and small, public and private, have seriously eroded the respect, affection and genuine pride which the American people have traditionally accorded to higher education and its leaders. Nor have student—and even faculty—expressions of outright hostility to all programs that tend to strengthen the defensive capacity of the United States—through research, through ROTC and other forms of cooperation—done much to endear the academic world to the overwhelming majority of the American people. Recent polls suggest that a growing segment of the general public has become disenchanted with higher education, appalled and repelled by many of its products.

These sentiments are beginning to show in a diminished flow of incoming gifts, and in adverse votes on education issues on state and local ballots. Sooner or later they may also be reflected in the treatment that colleges and universities can expect from state legislatures which must shape their policies to conform with the wishes of their constituents.

The ire of State and national officials and of the American public is directed in part against students who, in the words of the Attorney General of the United States, have established a "minority tyranny on the nation's campuses." It is aimed even more at administrators, trustees and faculty who have defaulted on their duty to protect the right of the other students, an overwhelming majority, to pursue their education without being subjected to interruption or physical violence. The adverse, and in some cases destructive, impact of that sentiment on the support of higher education may last for many years and possibly for decades.

Not without reason do the heads of institutions fear that increases in donations and state appropriations may be harder to come by in the future than they have been in years past. That is why they petition Congress to grant them immunity from the impending backlash. Enlarged Federal grants to institutions could for a time protect academia from the people's wrath. But they could also lead to a lasting alienation between town and gown, coming ironically at about the time of the greatest democratization of higher education, at a time when many institutions in their eagerness to make everybody fit for college have made college fit everybody.*

Nor has the efficiency with which educational funds are being spent, augmented the confidence of erstwhile and would-be supporters. Any industry that utilized its skilled staff and costly facilities as wastefully as the average American college or university would have been bankrupt long ago. Such waste has become excessive and flagrant in recent years. One of our most experienced academic management experts, Harold B. Wess, recently posed the crucial question: "Is Efficiency Taboo in Academia?" as the title of an article that merits attention (*Educational Record*, Winter 1969).

In 1968 even the American Association of University Professors admitted that, in contrast to the rest of the economy, higher education has registered little or no increase in productivity through technology. The Association denied that soaring costs are the product of either inflation or inefficiency; but it did conclude that "ways will have to be explored to increase productivity of those engaged in the educational process" (*Annual Report of Committee Z*).

Greater efficiency and a better product are more likely to emerge on the American campus when the voice of the broad public, upon whose efforts and good will the support of higher education ultimately depends, is no longer drowned out by the strident cries of belligerents bent on the destruction of our society and its institutions. It might well be that the public voice can speak and be heard more clearly if tax credits are used to aid education rather than Federal grants which aim to shield colleges and universities from the popular will.

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*According to a Gallup Poll, published March 16, 1969, [illegible]